



**BELFAST NATURAL HISTORY
and PHILOSOPHICAL SOCIETY**

144th-149th SESSIONS

PROCEEDINGS
and
REPORTS

**Sessions
1964/65-1969/70**

**Second Series
Volume 8**

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BELFAST NATURAL HISTORY AND PHILOSOPHICAL SOCIETY

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12th January, 1965.

HISTORY OF BELFAST HARBOUR

F. W. P. HAMPTON, B.Com.Sc.

It is an interesting fact that the first secretary to the Harbour Commissioners, Mr. Edmund Getty, played a prominent part in the formation of your Society in 1821. Maybe it was because he made such a success in launching the Society that he later received the Harbour Board appointment which came in 1847.

Be that as it may, I will start with a quotation from a general report on Belfast Harbour written by Mr. Getty in that year 1847. He wrote: "Originally this Harbour, which was a creek off the River Lagan, in the entrance to the stream now arched over in High Street, was under no regular government, and was, most probably, considered the property of the Chichester family.

"In 1637 the Earl of Strafford purchased from the Corporation of Carrickfergus—the only stronghold in the bay—a privilege they enjoyed of receiving to their use one-third of all the Custom's Duties on goods imported into that city, and other trading monopolies.

"From this time the trade of Belfast became important."

That quotation serves to introduce my subject, which is to outline the story of the very remarkable growth of the Port of Belfast from one small quay at the foot of High Street to the World Port that it is to-day. In fact, it is well to remember, as a general background to the whole scene, that practically the entire Harbour was constructed on what was formerly sloblands and which have been reclaimed from the sea from time to time.

The Harbour Crest, which appears on the Commissioners' notepaper, depicts Neptune leaning on a conduit or culvert through which is flowing the River Lagan. That could be interpreted as the Lagan having been canalised, and that, in fact, is what was done. It is in essence the story of the growth of the Port. The Lagan is the endowment of nature, but it had to be shaped and its very difficult estuary moulded to its present form, a task which has been carried out by successive generations of Harbour Commissioners.

The first mention of Belfast as a Port was in 1613, when, by Royal Charter, the Freemen of the Town were authorised to establish a wharf or quay. The records do not show when this was done, but we do know that a quay had been established on the Belfast or Farset River at the foot of High Street before the end of 1662, because in that year the quay was by Order in Council formally made a landing place. Until the middle of the 17th century, Carrickfergus was of greater importance than Belfast, but after that Belfast grew steadily bigger, aided, no doubt, by the purchase by the Crown of the right to Customs Duties already mentioned, for the sum of £3,000. It is interesting to note in passing that in 1636 a ship called "Eagle's Wing" which had been built in Belfast sailed for New England with prospective emigrants, but returned to Port.

Several other small quays were constructed in the same vicinity, but development inland was stopped by the construction in 1682 of the old Long Bridge, the forerunner of the Queen's Bridge. This was, however, a fortunate step because port expansion was directed seawards where the potentialities lay.

Th control of the original quay seems to have been largely in the hands of the Lords of the Castle and the Sovereigns of Belfast, their Executive Officer being a Water Bailiff. There is little information available throughout the remainder of the 17th century, although it is referred to as a place of brisk trade in the annals of the day, and steadily expanding.

All was not well, however, with the young Port. There were complaints as to the administration and management, and demands for additional accommodation. Complaints as to the administration appear to have subsided somewhat since those early times, but requirements for increased accommodation are happily ever present.

Early in the 18th century, in the year 1709, the complaints culminated in an effort on the part of the Corporation to promote a Bill with the object of enabling them to levy rates on goods for the purpose of forming a fund for cleaning the Dock and Harbour and for keeping the quay in repair, but owing to numerous disputes which ensued, the Bill never passed through Parliament. The pressure seems to have been relieved to some extent by private enterprise—a quay called the “Hanover” quay having been constructed on reclaimed land some time prior to 1720 by Isaac McCartney, whilst other small private wharves were constructed later.

The next important step in the evolution of the Port occurred during the third year of the reign of George II, viz., in 1729, when the Irish Parliament, which had evidently been considering the condition of ports generally, passed a Bill entitled “An Act for cleansing the Port, Harbour and Rivers of the City of Cork and of the towns of Galway, Sligo, Drogheda and Belfast, and for erecting a Ballast Office in the said City and each of the said towns.” Cork at that time occupied a much larger place in the picture than Belfast. Whilst this Act may have been excellent in its intent, its scope was entirely inadequate for the achievement of any substantial results, as it contained no provision for the construction of quays or docks and the Corporation could do little beyond supplying ships with ballast and keeping the channel clear.

In 1785 the situation had apparently become worse, and the Merchants, Traders and Shipmasters of the town drew up a petition which they presented to the Irish Parliament that year. The petition pointed out that ships had to anchor about three miles below the town, and the tedious and difficult navigation of those three miles, which only small craft could negotiate, greatly hampered trade. They suggested that the estuary of the River Lagan should be straightened between the town and the deep waters of the Lough.

That petition, arising also out of the private ownership of quays, which had led to serious disputes concerning the levying of dues on goods and on vessels was the direct cause of an Act of Parliament passed shortly afterwards which set up the first Harbour Authority for the Port. Its official title was “The Corporation for Preserving and Improving the Port and Harbour of Belfast,” but it was generally referred to as the Ballast Board. The Board which remained in existence for 62 years, was the means not only of focusing much public attention on the inadequacies of the Port but of inaugurating a number of important schemes to remedy the situation.

Surprising as it may seem, considering the inadequate Port facilities, there was a fair measure of foreign trade in the 1700's. A regular trade between Belfast and the West Indies was commenced in 1740 and about this time also there was a sizable emigrant traffic to the North American Continent. One record states that in 1748 there were “about 7 ships at Belfast carrying off about 1,000 passengers to America.” Among the places traded with towards the end of that century were New York, Philadelphia, Boston and Norfolk in America; Rotterdam, Hamburg, Gothenburg, Alicante, Cadiz, Oporto, Danzig and Memel in Europe. Shortly afterwards there were direct sailings to Australia and the East. The names of the ships are rather intriguing. On one day in February, 1797, among the ships which arrived at the Port were the “Good Interest,” “Happy Enterprise” and “Friendship,” followed shortly afterwards by the “Heart of Oak” and “Happy Return.”

The Port regulations do not seem to have been very rigidly applied for there are occasional entries in some of the old registers such as “sailed without paying dues”

or "went away without paying for ballast" or "pilot not paid on account of bad conduct."

The human touch was not entirely absent. One group of 149 passengers on board the "Peggy" wrote after they arrived at New York in June, 1799, expressing their thanks to the Captain for his "polite and humane attention during a voyage of 39 days."

In 1796 the construction of the first graving dock in the Port was commenced on behalf of the Ballast Board by William Ritchie, who was also the pioneer of regular shipbuilding in Belfast, having come from Scotland in 1791. This graving dock—235 feet long—was opened on 1st January, 1800, and was capable of containing three large ships of those days. Now over 160 years old, and known as No. 1 Clarendon Graving Dock, it is still performing useful service for small craft. Another slightly larger graving dock, the present No. 2 Clarendon Graving Dock, was opened in 1826.

Trade was increasing rapidly, and the era of the steamship had begun—the first steamship to enter the Port being the "Greenock" in 1816—but the Port was still without proper access to the deep waters of Belfast Lough. At that time the accommodation consisted of the Town Dock, Limekiln Dock and Ritchie's Dock, and one or two private quays. Vessels drawing more than 10 feet at neap tides had to discharge their cargoes into lighters at Garmoyle. Half a century elapsed from the time the Ballast Board was established before any positive steps were taken to remedy the difficulties created by the tortuous estuary of the River Lagan.

The plan which was eventually adopted in the 1830's followed in the main the advice which the merchants and ship masters of the town had given in their petition in 1785, namely, that there should be a straight channel from the Long Bridge to the deep waters of Belfast Lough.

Thus in the year 1839 the great expansion of the Harbour began, the cut to eliminate the first loop in the River being then commenced. The spoil which was removed was utilised to form what was then called "Dargan's Island," about 17 acres in extent, on the East side of the Channel. The Island was originally used as a pleasure ground, but in the 1850's iron shipbuilding yards were constructed. It has, of course, become famous under the name of Queen's Island, and has retained the designation of "Island" even though it was joined to the mainland in the 1860's.

Development and growth meant that the Harbour Authority must **not** be curbed in its aim to build a first class Port. Additional powers were needed, and in 1847, the Ballast Board was replaced as the Harbour Authority by the Belfast Harbour Commissioners. The Commissioners were given much more extensive powers than their predecessors, e.g., authority to purchase lands, borrow money, carry out improvements, levy dues on goods and on ships and appoint officers and pilots. Their first task was to complete the second cut through the River. The new Victoria Channel was opened to shipping in 1849. This was, without doubt, one of the most important undertakings carried out at the Harbour, but it was only the beginning of the Port as we know it to-day.

About the same time, the three old docks—Town, Limekiln and Ritchie's—were filled in and became, respectively, Queen's Square, Albert Square and Corporation Square. A new and extended Donegall Quay, and the Canal Quay were also constructed.

In every decade since that time, at least one new dock or quay has been constructed, apart altogether from continuous improvements to existing quays, installation of cranes, provision of sheds and so on. In the last 10 years the pace of development has greatly quickened.

I will not burden you with too many details, but in the main, development has followed the three-pronged pattern of the three Channels in the Port—Neptune's trident, as it has been described.

Between 1850 and 1900 numerous quays and docks were constructed on each side of the River Lagan, the centre prong of the trident.

Clarendon Dock was opened in 1851, Abercorn Basin and Hamilton Graving Dock in 1867, Dufferin and Spencer Docks in 1872 (since much improved, as originally there were dock gates). Milewater Basin in the same year, 1872, and Albert Quay in 1874. That period saw a tremendous spurt forward in the expansion of Port facilities, and I would venture to say, has only been surpassed by present day developments.

The Alexandra Graving Dock (802 feet in length) was opened in 1889, the first vessel to enter it being the "Teutonic," then the longest vessel afloat.

York Dock was completed in 1897 and, on the other side of the River, several wharves (Alexandra, Clarence, Victoria) were built for shipbuilding purposes.

The Musgrave Channel was cut out of sloblands and opened in 1903, providing more facilities for shipbuilding and, later, oil depots and an electric power station.

In 1911, the Thompson Graving Dock (886 feet) was opened, and was then the world's largest graving dock, giving a boost to Belfast's shipbuilding reputation.

Shipbuilding has been associated with the Port since its earliest days. The Irish oak of the Lagan Valley was no doubt an important factor at first, but, as we all know, it was the skill and enterprise of the men themselves that put Belfast in the forefront of the shipbuilding world. Names such as William Ritchie, Sir Edward Harland, Gustav Wolff, Lord Pirrie and, in our own day, Sir Frederick Rebbeck, spring to mind. The Harbour Commissioners have constructed numerous wharves at which the new ships are fitted out and others repaired, and special heavy lift cranes have been installed. Over one mile of quayage is normally devoted to shipbuilding purposes.

Following the 1914/18 War, a large scheme of reclamation was begun on the County Down side of the Harbour, and that has continued until the present day. It is mentioned here because it enabled the Oil Trade to be established with discharging facilities in the Musgrave Channel. Beyond the joining up of Spencer and Dufferin Docks, which I have already mentioned, there was little of importance until the year 1930, when the construction of the Herdman Channel and the Pollock Dock area began, again by cutting through sloblands. This was an important scheme and was the basis for development in berthage, which took place over 30 years and provided the third line of approach. The spoil raised was used in the County Down reclamation, and in 1938 sufficient land was available for use as an Airport. This was opened in that year and scheduled air services were operated until 1946, when they were transferred to Nutt's Corner. The Harbour Airport was, however, instrumental in setting up in Belfast the firm now known as Messrs. Short Brothers & Harland, Ltd., who, in 1936, established an aircraft factory at the Airport.

During the last War, wharves were constructed at the Airport, where aircraft carriers and other ships could land or discharge aircraft direct to or from the airfield, a unique combination of land, sea and air transport.

During the War, also, the Port was intensively used as a Naval Base and as many as 82 Naval craft were berthed there at one time. Additional accommodation was provided by constructing a large deep-water wharf on the West side of Herdman Channel, and by an extension citywards of the Pollock Dock system, thereby providing another 2,000 feet of fully equipped deep-water berths.

As soon as conditions permitted after the end of the War in 1945, the Commissioners embarked on a programme of reconstruction and strengthening some of the older quays. This allowed deeper water to be provided in the berths, principally at Queen's Quay,

Abercorn Basin and Albert Quay, where new cranes with a much higher rate of discharge have been installed.

A ramp for ship to shore connection was installed at Pollock Basin East for a transport ferry service, operated by the Atlantic Steam Navigation Co. Ltd., to and from Preston which commenced operating in 1950.

Belfast Corporation constructed a second electric power station on Harbour property, on the West Twin, and a 400-foot wharf for the discharge of coal was constructed by the Commissioners and opened in 1954.

The following year marked the beginning of the first of two large development programmes necessitated by increased trade, industrial development and the larger ships using the Port. The improvements cost £4 millions up to 1961, and the present phase is estimated to cost a further £5 millions by 1966.

Sinclair Wharf and Shed for the general foreign trade were the first works to be completed in 1958, named in honour of the Chairman of the Board, Sir Kenneth Sinclair, D.L. This deep-water wharf is 1,241 feet in length and the shed covers three acres being 1,100 feet x 120 feet single span. The facilities were specially designed to facilitate the use of mechanical cargo-handling equipment, with wide quay space, large door openings and high head room inside the shed.

Early in 1959 a 200-ton cantilever crane was installed on Stormont Wharf, a new deep-water wharf on the West side of Victoria Channel. This is the largest crane in the Port and its purpose is to provide adequate facilities for new industries in the Province. Stormont Wharf was originally 648 feet in length, but to cope with the growing foreign trade of the Port was extended in 1962 to 1,902 feet, and a very large transit shed, 1,140 feet x 145 feet single span, was constructed on the extension.

Link Line, Ltd., commenced a special daily container service to and from Liverpool in 1959, operating first of all from Spencer Dock "A" but later transferring to the Ballast Quay, where two 25-ton cranes were installed for the traffic.

In 1960 a new section of quayage was constructed on the West side of Herdman Channel as an extension to the existing Herdman Channel Wharf, and the entire berthage, 1,770 feet in length, was named Gotto Wharf in honour of a former senior Harbour Commissioner. This gave three new berths for the daily general cargo and container services operated by British Railways to and from Heysham. The berths are equipped with four transporter and portal cranes with lifting capacities up to 15 tons and a transit shed 690 feet in length, with ample open space for the handling of containers. The new berths came into use in 1962, and eased the pressure of cargo-handling at the passenger berths at Donegall Quay.

In 1958/59 the Victoria Channel was deepened to 26 feet 3 inches below Harbour Datum and widened from 300 feet to 400 feet, at bottom dredged level, seawards from the Turning Basin at the junction of Victoria, Herdman and Musgrave Channels. A further large dredging programme followed in 1961/63, when the Channel was extended seawards by 2 miles and, over most of its length, was deepened to 30 feet below Harbour Datum and widened to 500 feet.

Spoil raised in dredging operations is deposited on the Commissioners' reclamation areas.

On the County Antrim side of the Harbour, 50 acres of foreshore were reclaimed as a result of the 1958/59 dredging programme, and a further 80 acres are in course of reclamation. On part of the 50-acre area, a fertiliser factory, owned by Richardsons Fertilisers, Ltd., was constructed in 1962, a remarkably short time after reclamation was completed. The factory is served by Richardson Wharf, 500 feet in length, equipped with a 7½-ton crane.

On the County Down side, some 850 acres of foreshore have been enclosed and largely reclaimed since 1920. Apart from the land comprising the Airport, recent

developments in this area have been in connection with oil. B.P. Refinery (Northern Ireland), Ltd., have constructed an oil refinery—the first in Northern Ireland—which was opened in 1964. It has an initial throughput of 1,300,000 tons annually, the crude oil being brought in tankers up to 32,000 tons d.w.t. from the Middle East. The Refinery Jetty, with a depth alongside of 37 feet below Harbour Datum, is at the end of a 1,000 feet causeway. Refineries more often than not bring associated developments, and Belfast Corporation have constructed a gas reforming plant which utilises gas from the Refinery and supplies a portion of the City's requirements. As announced recently in the Press, they contemplate extending the plant.

In August, 1964, the first vessel arrived at West Twin Wharf, which serves a new grain silo of 25,000 tons capacity on the West side of Victoria Channel. The silo was erected jointly by Messrs. W. & R. Barnett, Ltd., and Messrs. R. & H. Hall, Ltd., who have operated separate silos in the Port for many years. The Wharf is 500 feet in length, having a depth alongside of 33 feet 3 inches below Harbour Datum, and there is a 195 feet export wharf. As these wharfs are in extension of Stormont Wharf, there is a continuous length of 2,700 feet of deep-water accommodation on the West side of Victoria Channel.

To summarise recent developments, out of the 8 miles of quays over 2 miles have been newly built or reconstructed. This allied to the new transit sheds, cranes, roads, dredging and ancillary works, has kept Belfast in the forefront of development amongst British Ports.

A Committee of Inquiry into the Major Ports in Great Britain, which reported in 1962, sharply criticised Ports for not having provided sufficient deep-water accommodation, and in many cases none at all in the post-war period. This report has led to the establishment of a National Ports Council in Great Britain, in the main to facilitate planning on a nation-wide scale. The Council's functions do not extend to Northern Ireland, but it is of interest to mention that the kind of physical development they are aiming at—wide deep-water quays, spacious transit sheds and so on—are the very ones which have been included in the Commissioners' developments since 1955.

An excellent general design has resulted from the gradual evolution of the Port. On the map it resembles, as I said, a trident—Victoria Channel forming the central prong, and the Musgrave and Herdman Channels opening out to the South-East and South-West respectively. The design enables water-borne traffic to be brought into the City on three lines of approach.

The quays are equipped with 64 dockside cranes with lifting capacities up to 200 tons, and transit sheds cover 31 acres.

Over 8,000 ships arrive each year with a net register tonnage of 7 millions. Imports and exports total 6 million tons, and our trade is with all five Continents. The large bulk items are coal, grain and oil. During the past 10 years there has been an increase of 2 million tons in shipping and 1 million tons in goods. Especially notable has been the increase in foreign shipping which has doubled in that period, from 1 million to 2 million tons. Container and ferry traffic is also growing rapidly, and last year half a million tons of goods were shipped through the Port by these methods. There are the two specialised daily container services which I have mentioned, with Liverpool and Heysham, and a thrice weekly service to Garston, plus the roll on/roll off service with Preston. Most of the other regular shipping services carry containers, so that we have, perhaps, a dozen ships regularly carrying containers to and from the Port both to Great Britain and the Continent. This gives a full range of freight services right to the centre of our industry and population.

As the great natural outlet of Northern Ireland, the Port handles about 70 per cent. of the trade of the Province, and its imports and exports are valued at about £500 millions annually.

The Harbour Commissioners administer the Port as a Public Trust, and all surplus revenues are ploughed back for the further improvement of Port facilities. The main sources of revenue are rates charged on Vessels and on Goods, which, I may say, compare very favourably with other major Ports in Great Britain.

I began with a quotation and perhaps it would be well to end with another, this time from an impartial outsider, Dr. Henry Rees, a geographer from Coventry. In a recent book he writes:

“Belfast is a virile City. By nature rather poorly endowed for shipping, her people have built up a harbour which compared with our major ports. . . . The little Wharf at the mouth of the Belfast river was the germ of the present port; but the modern harbour is entirely artificial. In this respect no other British port can be compared with Belfast. A system of basins has been carved out of the mudbanks of the river estuary; navigable channels, wide and deep, have been excavated, and the resulting clays and silts have been dumped into prearranged areas to build up new land for industry and warehouses”

and, he might have added, for more docks and quays.

9th March, 1965

"THE BIRTH OF THE AEROPLANE"**DAVID KEITH-LUCAS, M.A., M.I.Mech.E., F.R.Ae.S.**

My subject is the birth of the aeroplane. By this I mean the beginnings of manned flight in heavier-than-air machines. It is not going to be a "history" insofar as I am not going to present a chronological account of the events or the people who contributed to those events. I want to trace the growth of understanding of the fundamentals of flight—of lift, drag, propulsion, stability and control. Not so much a history, more an exercise in hindsight.

The simple fact is that on December 17th, 1903, at Kill Devil Sandhills, near Kittyhawk in North Carolina, two men, Wilbur and Orville Wright, were the first to make a powered flight in a heavier-than-air machine which depended on aerodynamic lift—in other words, in an aeroplane.

To-day flying is so much part of our lives that we think little more of flying to London than of taking a bus to Bangor. The Wrights flew at less than 40 m.p.h. We fly to London in a Vanguard at 400 m.p.h. and experimental aircraft have now exceeded 4,000 m.p.h.

We might say that the Wrights started something. But, of course, they were not the first to try to fly—ideas, designs, strange contraptions were produced many years before the Wrights. Flight was surely a dream ever since primitive man observed primitive birds or flying reptiles. The dream evolved through the feathered wings of Daedalus and Icarus to ideas of "magical vapours" to aerial steam carriages. We are not concerned with this dream cuckoo land. Our concern is in the field of science and understanding and what it was that the Wrights really did. Why did they succeed when everyone before had failed?

Fifty-five years before the Wrights (in 1848) Henson and Stringfellow had been very near success with powered models which did in fact fly.

Fifty years before the Wrights, Sir George Cayley had built a man-carrying glider and flown it successfully. This was the famous occasion when his coachman was successfully launched and glided across a small valley pursued on foot by the wildly excited onlookers. On arrival at the other side the coachman was heard to say "Please, Sir George, I wish to give notice. I was hired to drive, not to fly." Poor coachman, he might so easily have won fame and glory but all he got was his cards!

Since then Lilienthal in Germany and Percy Pilcher in England made a number of successful glides and Lilienthal, particularly, had furthered the art considerably. We will come back to them in a moment.

These successes in themselves show that there must have been a considerable background of understanding of the principles of flight. They probably did not recognise it then but Daniel Bernoulli had given them the key as long ago as 1750 or thereabouts. Bernoulli showed that if a current of air is slowed down by an obstruction of some sort so that it loses velocity energy, its pressure will rise in such a way that the total energy, which is the sum of velocity energy plus pressure energy, will remain constant. Conversely if it is speeded up, as for example by flowing through a venturi tube or over the top surface of a wing, the pressure will fall. This low pressure on the top surface of a wing is the basic cause of lift.

Earlier experimenters had failed to appreciate this and had been obsessed with the idea that birds derived their lift by beating the air down with their wings. Even Cayley, who clearly understood the nature of wing lift tried to propel the aircraft by flappers or paddles which he used for beating the air.

It is interesting how closely they observed the outward shape of birds without, of course, understanding the true principles. When one of Cayley's flappers is compared with the wing of a Great Tit, there is a strong resemblance, but Cayley's flapper was made of hinged slats which were meant to close on the backward or driving stroke and open on the forward stroke. He hadn't quite got rid of the idea that birds rowed themselves along, using their wings as oars.

It was a curious obsession of Cayley's to try to propel aircraft with flappers when the propeller was already well established. It seems that Cayley just didn't like rotating machinery but preferred levers and links. Perhaps he felt that if nature can do without rotating machinery then why should not he. This raises the old question of whether a horse would have been a better horse if nature could have given it wheels. But I digress.

In spite of all this, the principles of propulsion were not unknown. Leonardo da Vinci had shown a helical propeller or rotor in his drawings of a helicopter in about 1500 A.D. and it is thought that the idea originated in China in the 4th century. Moreover the French balloonist Jean Pierre Blanchard had one in his balloon when he made the first Channel crossing by balloon in 1785. It was only hand operated and wasn't much good but it was there. At least, it was at the beginning of the flight but there is some suggestion that he chucked it overboard as ballast before the end.

I have used the words "lift" and "propulsion" and treated them as if they were quite distinct. In fact the realisation of their separate natures must have been one of the most fundamental discoveries.

Henson and Stringfellow in their design of an aerial steam carriage had arrived at the classical aeroplane configuration of fixed wings for lift and a propeller for propulsion. Almost certainly they recognised lift as the upward force necessary to overcome the downward force of gravity, and the propulsive force or thrust as that necessary to overcome air resistance or drag. Cayley certainly understood this and realised the important fact that lift, which in steady flight has to be equal to weight, must be constant at all speeds whereas thrust must increase with speed to overcome the increasing drag.

A bird's wing is most carefully designed to fulfill the two purposes of lift and propulsion—a fact which concealed the separate nature of these two functions from the early investigators. By the same token a man's mouth is designed for the two functions of eating and speaking whereas a man-made robot would probably have to have two separate organs, a refuelling orifice and a loud speaker. So too the simplest approach to a man-made bird has to have the separate organs of wings for lift and propeller for propulsion. It is only after considerable refinement of design that we can make a single organ to combine the two functions.

Before leaving this subject of lift and drag, I think I should point out that the distinction is not quite as clear cut as I may have inferred. The lift of a wing does not act truly vertically but is inclined backwards and therefore contributes to drag. This drag-due-to-lift is called "induced" drag and a proper understanding of it did not come until after the Wrights' first flights. It was Lanchester in 1907 who propounded the circulation theory of lift and enabled us to understand the mechanics of flow over a wing and to calculate the load distribution and the induced drag. Lanchester gave us the image and Prandtl clothed it in mathematics. This was an early example of European co-operation in aeronautics.

Before that it had been said that "Mathematics, up to the present day has been quite useless to us in regard to flying." Now, of course, aerodynamics is one of the more mathematical branches of engineering.

It would be easy to imagine that with their background of knowledge and especially the gliding experiments of Lilienthal and Pilcher that all that was now needed was a light enough engine to drive the propeller.

It is true, of course, that the earlier pioneers had no suitable engine and had to rely on steam engines or muscle power, neither of which was of much use for the job. Even the Wrights found that existing automobile engines were too heavy for their power and they had to design and build their own engines.

Their first engine, used in 1903, gave, I think, about 12 h.p. Subsequently they improved it a lot and got as much as 50 h.p. Here we have one which was fitted in the Wright Biplanes built by Shorts in 1909. This incidentally was the first aircraft production contract ever placed in the world and is the basis of Shorts claim to be the "first manufacturers of aircraft in the world." We still have this engine on show at Queen's Island.

It is a beautifully made engine, four cylinders and water cooled and incorporates a lot of brass and bronze which looks delightful but for weight reasons could not be tolerated in a modern engine. Nevertheless, it was light and powerful in its day.

It is interesting, in passing, to compare the 50 h.p. of this engine with the 5 or 6,000 h.p. of each of the four engines which power a B.E.A. Vanguard or a Short Belfast to-day.

This engine of the Wrights was a fine achievement but the really significant contribution made by the Wrights was not that at all. It was their understanding of stability and control and, above all, of the relationship of the one to the other.

Wilbur Wright once said "When once a machine is under proper control under all conditions, the motor problem will be quickly solved." This, I think, clearly shows what he recognised as the crux of the matter. In the solution of this problem they had very little to guide them. All they had were balloons, gliders, boats and observations of birds in flight.

Let us examine the balloon. It is naturally stable if uncontrollable. When it lists to one side the lift force, acting through the centre of buoyancy, is still vertically upwards and the gravitational force, acting through the centre of gravity, is still vertically down. The result is a restoring moment.

Not so with the an aeroplane. Here the lift force acts at right angles to the wing and therefore cants with it. The result is not a moment but a side force. All that happens is that the aircraft slips sideways. Nevertheless this fact is used to give stability by giving the wings an angle of dihedral. It needs some imagination but I think you can see that the effect of this is, that when sideslipping the leading wing will be at a larger angle of attack than the trailing wing and will therefore give more lift. This in turn produces the required restoring moment.

It was for this reason that early gliders had a large dihedral angle and early aviators like Lilienthal, Pilcher and Cayley's coachman could glide satisfactorily in a straight line but could do little to control the direction once they were airborne. All they could do was to shift the centre of gravity by swinging their own bodies about. It is just as well that we have progressed beyond those days and do not have to ask the passengers to dash up and down the cabin to control a modern airliner.

You can see how it was that the early gliding experiments were not of much help towards building a controllable aeroplane.

These early pioneers all thought of an aeroplane as being stable like a ship and steered in direction by a rudder and steered up and down by a second rudder or elevator mounted horizontally. Quite often they tried to combine the two into a cruciform tail like an arrow or a dart, the whole thing being wagged from side to side or up and down, while the captain stood on the bridge and gave orders.

Nobody before the Wrights had really understood the need for lateral control, that is ailerons or in the case of the early Wright machines, of wing warping.

Instead of fitting hinged ailerons as on all modern aircraft, the Wrights got the same effect by bending or warping the trailing edge of the wing against its own elasticity. Actually they ran into a lot of trouble over this. The difficulty was that the wing section already had a lot of curvature or camber. Now, supposing the pilot wanted to bank to the left so as to turn to the left, he increased the camber to give more lift on the right wing. Unfortunately this had the effect of increasing the drag on the right wing and so of trying to make the aircraft turn right. To overcome this the pilot had to apply rudder at the same time—or end up in a tangle.

It took the Wrights quite a while to sort this one out and they had some nasty mishaps in the process. In the end they interconnected the rudder with the wing warping control. Even with ailerons on modern aircraft this problem of "adverse yaw" is still with us. It has to be taken into account in the design of aircraft even to-day.

The underlying significance of all this is that in providing lateral control the Wrights appreciated that an aeroplane's controls have a dual function. They are not only the means of steering, they are also the means of balance.

All previous attempts to make a fully stable aircraft and steer it like a ship had failed. In the words of Wilbur Wright "we therefore resolved to try a fundamentally different principle. We would arrange the machine so that it would not tend to right itself." The wings of the Wright Flyer were entirely devoid of dihedral. In fact there is a slight anhedral angle, the opposite of dihedral. It was a realisation of the part which the pilot and his controls had to play—he becomes part with his machine in the balancing act and cannot stand aloof on his bridge giving orders.

It may be that the Wrights realised this from bitter experience. On the other hand they were acute observers of birds and may have seen how a seagull soaring in an up current of air continually gives little twitches or twists to restore its balance. Most likely too they were influenced by their own upbringing. They were bicycle manufacturers before they were aeronauts and the bicycle is not inherently stable but depends on the rider's control movements to maintain balance.

I would like to digress here. I do not want to give the idea that the Wrights were simple mechanics who had a lucky inspiration. They were in fact painstakingly scientific in their approach. They started with kites; went on to gliders which were a great advance on Lilienthal's or Pilcher's; found that the current knowledge on air forces was insufficient and misleading and so built a wind tunnel and derived the basic facts for themselves. Only after all this did they go on to build a powered aircraft and incidentally to design, build and develop its engine too. They were two really remarkable men.

Returning to the matter of stability and control, writing 50 years later, S. B. Gates of the Royal Aircraft Establishment, Farnborough, said this about the problem:

"The traditional term 'stability and control' conceals, in its implied dichotomy, a pernicious fallacy of the problem. 'Handling' is better; a solid, blunt word of the air earthy, implying unity between man and machine. Stability and control are two aspects of the same matter, as closely bound as the sides of a coin. It took us more than 20 years of theory and experiment to get this notion fully worked out and make it work reasonably well."

It may well have taken 20 years to understand it. I sometimes wonder whether we have fully understood it yet, but in that first jump the Wrights took the vital step towards making it work.

They realised the importance of control and in their enthusiasm for it they practically chucked stability overboard. This we can now see as a mistake. Stability

need not be, as they thought, the enemy of control; it can in fact make for easier and more precise control. They are, as Gates said, two aspects of the same matter.

In trying to get a feeling for the problems they were up against and the way their minds worked, we keep finding references to "powered, sustained and controlled flight." Perhaps it is summed up in a conversation between Wilbur Wright and a famous American balloonist, Colonel Lahm.

"Even a barn door can be made to rise in the air if inclined at an angle and with sufficient power behind it, but that is not flying. The problem is to keep it in the air and that involves means for control and balance."

This is the crux of the matter. The Wrights were not just the first to achieve powered flight; they were the first to achieve powered sustained and, most important of all, controlled flight.

We at Shorts should have a special fellow feeling for the Wrights for when we came to design the SC1 vertical take-off aircraft we found ourselves almost back to where the Wrights were in 1903. We had jet engines to give us lift but we were faced with the new and yet old problem of how to achieve stability and control. What part was the pilot to play in the balancing act. But we had 50 years of powered flight to guide us and we had all the modern techniques of gyro stabilisation at our command and analogue computers so that we could test our theories in the safety of a ground borne simulator. How the Wrights would have envied us!

All that I have said so far has been about making an aircraft which would fly. The next and vitally important phase was to make an aeroplane which would be useful.

In 1909, only six years after the first powered flight M. Louis Blériot flew the Channel. But a year after that, in 1910, the British Secretary of State for War made the memorable statement: "We do not consider that aeroplanes will be of any possible use for war purposes."

It was a shockingly negative prophecy and contrasts strangely with Orville Wright's view that "When my brother and I built and flew the first man-carrying machine we thought we were introducing into the world an invention which would make further was practically impossible."

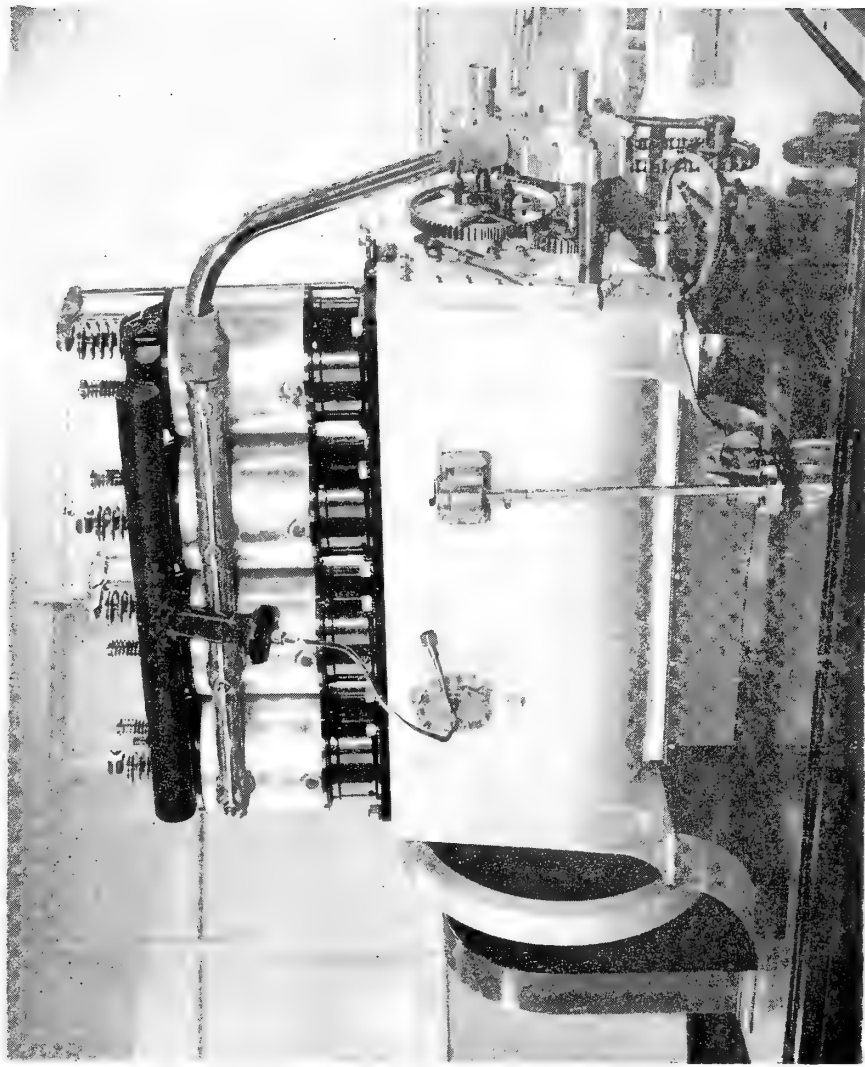
How many people before and since have thought the same, from the invention of the bow and arrow to the invention of the atomic bomb.

Both the Secretary of State and Orville Wright were wrong but neither was as foolish as they may now seem in retrospect. What the Secretary of State recognised was that there was a big difference between making a machine which could fly and making one which could do a useful job of work.

I will take one little corner to show you what I mean. I have already spoken of the way that the early pioneers tried to make the aeroplane stable like a ship and to steer it with a rudder. This was natural because men were familiar with ships but utterly unfamiliar with flying. The same thinking governed the early approach to instrumentation and navigation. The compass and the air speed indicator (or, in nautical parlance, the "log"), were thought to be the two essential instruments with a height indicator or altimeter, in the form of an aneroid, thrown in for good measure.

So they take a ship's compass and put it in the aeroplane and to their surprise it doesn't behave as expected.

Not only did vibration cause errors which sometimes amounted to as much as 42° (here I quote from a Farnborough report of 1914) but, even when these were eliminated, there remained "tilting" and "acceleration" errors which, during conditions of acceleration or in turns, could produce yet larger discrepancies. These arise because the forces due to the earth's magnetic field are inclined to the horizontal and tend to make the compass needle slope downwards towards the North. This is balanced



Engine built by Shorts in 1909

by a small weight to the South of the pivot. When the compass is tilted or subjected to acceleration, the gravitational or inertial forces on this weight can have a component at right angles to the pivot and so cause the needle to rotate.

May I quote from the report which I have just mentioned:—

"It might appear that the errors of the compass in turning are of no practical importance because no pilot wants to read his compass in a banked turn. This is true of turns voluntarily made, but the main use of the compass should be to tell the pilot whether he is turning or not, and this use those errors may prevent."

It goes on:—"It seems not improbable that this trouble does make itself felt in practice. It may well be the basis of the statement, often heard, that the compass goes wrong in a cloud, and of the stories of pilots having followed the compass through a cloud and come out at the side by which they entered."

A compass was made in 1917 at the Admiralty Compass Observatory at Slough designed to overcome those errors as far as it was possible to do so.

It was of course entirely the wrong instrument to use for blind flying, and it was not long before special instruments such as the gyro operated artificial horizon and the gyro compass were developed for the job.

I have chosen this example to illustrate the problems which arose when the aeroplane had to do a real job of work. I see those early days of the 1914 war as the beginning of aviation as opposed to merely flying. There were no specialists in any of the problems so a team of young men was recruited comprising mathematicians, physicists, engineers, biologists and pilots. I should perhaps confess that my choice of the compass as an example was because that particular job was done by my father who was a physiologist and had been working in the field of nerve and muscle impulses.

It is, I must emphasise, only an example. Other problems were to design gun sights and bomb sights which would give reasonable accuracy in spite of the somewhat erratic behaviour of the aeroplane itself; to overcome the hazards of ice formation on the engine air intake and on the wings and tail surfaces; to find a way of communicating with an aeroplane in flight so that it could do a useful job as an artillery spotter, and so on.

The importance and the success of these efforts can be told most graphically by recounting the story of the first non-stop flight across the Atlantic by Alcock and Brown just one year after the end of the war and only 16 years after the first powered flight.

To-day when we land at London Airport feeling perhaps a little dazed after dozing all the way from New York at a speed of 600 m.p.h. we are greeted by a statue of Alcock and Brown. It is worth stopping to think what they went through!

It was a hazardous journey which reads more like a fictional thriller than a true-life story. At one stage they were so buffeted in a storm cloud that the pilot lost control and went into a dive. They plunged from 4,000 feet to something less than 100 feet over the waves before regaining control. Almost immediately afterwards they suffered icing of the engine intakes so that the engines lost power and the navigator, Brown, had to climb out on the wing, hanging on to the struts in the full icy blast of the slipstream and clear the intakes with a knife. Then the radiators began to get blocked with ice so that the engines began to overheat. The next thing was the control surface; the ailerons practically jammed and the rudder and elevator movements were restricted. They flew into warmer air just in time but even then their troubles were not over; on sighting land they could find no suitable landing place so finally decided to try a bit of firm looking bog at Derrygimla near Clifden in Co. Mayo. It was far from firm and the wheels dug in and up the aircraft went on its nose, doing some damage, mostly to the propellers but very little to the two men. I always enjoy Alcock's remark: "Your bog is like the Irish question—not as easy as it looks."

Looking back on that story it is a marvel of human endurance in an open cockpit with no cabin heating, hands, feet and sandwiches frozen stiff. It is also a marvel of aircraft design that this Vickers Vimy, a converted bomber could achieve this only 16 years after the first tentative powered flights. It is also a triumph for the development of navigational and other instruments that they were able to do this thing, albeit only just!

We could go on from here to talk of the developments of all metal aircraft, of the monoplane, retractable undercarriages, jet engines and supersonic flights. But my subject was the birth of the aeroplane—I have gone further and have watched it through its infancy.

I am not going to be drawn into a discussion of the future and least of all into the future of any particular firm. I will just say this. If we allow our aircraft industry to disintegrate, our children's children will look back on 1965 in amazement and say "Why couldn't they see what was still to come? Why on earth did they give up when we were just coming to the most exciting phase. Were they so conceited as to think that they had done all there was to do and invented all there was to invent? What fools they were!"

After all, flying is only 62 years old. It may be out of its infancy but it is still very much in its youth.

14th December, 1965

NORTH DOWN AS DISPLAYED IN THE CLANBRASSIL LEASE AND RENT BOOK

M. A. K. GARNER

The Town Council of Bangor are the fortunate owners of a very interesting document. This is a Rent Roll and Tenures of the Estate of Henry Lord Viscount Claneboy and Earl of Clanbrassil, showing the Estate of which he died seized of.

The earliest of these leases is dated 1623, and they continue on through the century, while at the back of the book are dates running into the 18th century. The last entries are in the form of notes.

These tenures give a lively illustration of the life in North Down as lived by our ancestors, little glimpses of their food, their houses, their agriculture, their difficulties and their pleasures: I have tried to sort out these references and place them together so as to make as clear a picture as possible.

The leases were granted in many cases to people whose names and descendants are very familiar to us at the present day, as are the towns and townlands to which they refer.

Henry Lord Viscount Claneboy was the last direct male heir of his line. He was the grandson of James Hamilton later Viscount Claneboy, who was granted the lands of North Down by James 1st. These lands became the subject of a very long drawn out law suit after the death of the last Viscount. But my subject does not deal with such grand people, though I must say the character and monetary difficulties of Henry Earl of Clanbrassil and Alice his wife, are reflected in the references to loans which are recurrent in the leases.*

In comparison with our present landscape it is rather hard to imagine. There were no boundaries, ditches, hedges or fences. Thomas Raven who made the magnificent series of estates maps for the 1st Viscount uses rocks and trees as meares, such as "ye crabbe which is ye meare" or a "white thorn tree." Unlike modern Down there were hardly any houses set alone, only some wretched cabins in groups in the few towns. There were huge mosses or bogs in which stood islands. These hillocks in the Ards, still called islands, really were islands. In reading contemporary or nearly contemporary accounts, it is hard to realise that the land had deteriorated so badly in such a short time. The poet Spenser who died in 1599, marvelled at the wealth of Ulster. "It was so thickly inhabited and as well stocked with wealth as any portion of England." At the beginning of the century a governor on his march wondered "that by so barbarous inhabitants the ground should be so well manured, the fields so orderly fenced, the towns so frequently (crowdedly) inhabited, and the highways and paths so well beaten." To judge from the Raven Maps this would not appear to be the case. In fact the effects of the troubles of the last quarter of the 16th century in North Down were disastrous to the people and the land.

In 1572 Sir Thomas Smith was given a grant of the rich district of the Ards in East Down. He sent over his son to prepare the way and he was promptly chased to the walls of Carrickfergus by Sir Brian MacPhelim O'Neil of Clandeboye who laid waste the Ards and murdered Henry Savage, the chief representative of the Norman settlers in that district. These lands were then granted to the Earl of Essex. That move was a failure too, so when Montgomery and Hamilton received the grant, the area was a desert.

*Loans £2,617 from 20 tenants. Amounts from £200 to £10

The planters who arrived with Hamilton and Montgomery were many of them younger sons of respectable families, but there were others who were wild and dangerous, who were only too glad to get away from Scotland to a new country. All the same they seem to have carried out the contracts in their leases, for the maps show a satisfactory improvement on the wilderness to which they had come.

Given the land, next comes agriculture, and the first requirement was fencing or rather enclosure. This takes a prominent part in the leases and it was to be accomplished by hedging and ditching. A lease near Comber shows how it was to be done. "Cattogs with Robert Rosse 1668 and to ditch the premises from ye adjoining lands by ditching and quick settting 20 perches each yeare till the whole be ditched." 20 perches seems to have been the usual length each year and preferably planted with quick sett, though furrers are also mentioned. In 1680 a lease states "Robert McCrery to ditch and enclose ye premisses, to sett" (that means plant) "ye land with quick sett" (i.e., living plants or it could mean hawthorn). One unfortunate man, McMecean of Church Quarter, Bangor, in 1673 renting land in Ballynagee, the modern Ballymagee, "a clause to enclose the premises, especially ffinlays meadow, which he is to do without neighbourhood." I take that to mean that he would have to do it without the help of a neighbour. "Neighbouring" usually meaning the giving of help at harvest time or some such emergency. Then there were some lucky people, for Tho. Bradley in 1669 leased "Ten acres of land in the further end of ye Moory Park next to Boolyhill . . . and to keep the fences in repair," so by 1669 some land immediately near Bangor was fenced. James Mitchell is to ditch six acres of land within three years with a double ditch and plant the same with quick sett or furrers "under ye penalty of one pound ster. for each year after ye said years." John Watt of Holywood is to pay 6d. for each perch yearly, if he does not ditch and quick sett 20 perches yearly.

Once having dealt with the fencing the tenant could get on with the ploughing and it would appear that they ploughed too much. In Ireland generally, ploughing had not been popular, but as usual there are conflicting statements. In 1611 corn was exported to Spain, and in 1619 there were complaints that the Plantation lands in Ulster were not being sufficiently tilled. "The English and Irish being afraid to work their land owing to a feeling of insecurity, were it not for the Scotch, who plough in many places the rest of the country might starve." So says Rawdon. This was not always the case.*

So we get "James McCartney, Robt. Douglas and Thos. Stoop of the towne (i.e., townland) of Ballydreen in 1671" "A covenant that they shall keep a two-thirds part of the premisses unplowed for pasture and meadow" or in another lease "Not to plow it every third year nor ye last of ye 7." That is, I think, ploughed four times in seven years. Again "not to plow above two-thirds yearly." Ja. Clelland is to "lay Skipperstone Park . . . for seven years to plow and surrender above £5 11s. 8d." The manual labour was probably done by the Irish, for in a book of 1673, "The Present State of Ireland," it says that "The numerous train of tenants and adherants (of the Irish Lords) willingly stayed behind and became tenants to the no small advantage of the English." In fact as Dr. Digerson calls it, the "settled sub-stratum" of the original inhabitants. The cottiers had always done the menial tasks, the small amount of ploughing and the herding of the cattle. They had not yet become inert and lazy, as was to happen in the 18th century. At this time the settlers found them "quick and clever at their work."

*"The Irishmen have been so addicted to tillage that a bristowe (Bristol) barrell of barley was sold but for 18d. in the market of Colraine."

"A Project of Sir Thomas Phillips for the Londoners plantation in the county of Colrane and the Derry sent to Robt. Earl of Salisbury." 1611. Mss. P. 148.

There were some odd customs to overcome, such as ploughing by the tail and plucking the wool from the live sheep instead of shearing. The native Irish ploughed as little as possible, using their corn mainly for their horses or for making aqua vitae. Indeed Con O'Neill was "so right Irish" that he cursed all his posterity in case "they should either learn English or sow wheat."

The crops sown by the planters were almost entirely oats and barley. This is shown clearly in the rents to which I will refer later. Wheat is only mentioned once in Jane Boids rent of 1673. It is likely that much of this barley is bere. At any rate bere was grown for the Bere Hill is shown in the Raven Map of Bangor. Bere or bigg was distinguished from ordinary barley, by having four rows of grain instead of two. It was not so liable to "lodge," that is lie down in wet weather, and it could thrive on poorer land. It was a favourite Scottish crop. As many of the settlers came from Ayrshire in the Hamilton train, it is likely that the manner of agriculture was much the same as in that county.

In Ayrshire in the 18th century, for I cannot find any description of farming in the 17th century, the Infield, that is the land nearest to the farm, was kept under constant tillage and received all the available dung. First bere was grown, then two crops of oats unmanured. From the Outfield, a crop of oats was taken as long as it was considered worthwhile.

The old Scotch tillage was confined to one period between February and May. Sometimes on sandy land bere was grown with a simple harrowing on unploughed land.

In the South of Scotland peas and beans were an important crop and a Pea Hill is shown on a Raven Map. Weeds apparently did not worry the farmer much, as at least in Scotland, they were inclined to think that weeds helped the crop, protecting it from the weather and birds. Wild Chrysanthemum was the only weed they did not like and thistles were pulled up for horse fodder, with an instrument called a cloumait, large wooden pincers. We used these ourselves. As for manure, dung was collected in the steadings, for the cattle would be driven into the bawn as had been done from time immemorial. The mere (pure) Irish still shared their cabins with their few beasts, in order to keep them safe at night. All this manure went onto the Infield. Kelp or sea wrack was also used as a fertiliser, as indeed it was until quite lately. A note at the back of the Clanbrassil book says: "Alex. Hanna offer 12d. per anno for ye kelp." Kelp or oar weed is harvested in the autumn of the year. In later days Harris says it was too valuable to use as manure and was burned to kelp and supplied to the linen manufacturers and exported to Dublin and Bristol for the use of the Glass Houses.

The cattle, at least the earliest known Irish cattle, were called "Black," rather in the manner of the "Black North," though in the case of the cows, it would appear rather in the way of an endearment, for they were not black but varied, though they were often of the type of the browny black Kerry. The Moilly is thought to have arrived in Ireland from Scandinavia, its arrival coinciding with the Norse invasions approximately in the 9th century. The Montgomery Manuscript says that the Planters brought some cattle and sheep with them, but the majority would likely be Irish. White cows with red ears were much valued by the Irish. These were thought to be fairy cows.*

A Booly Hill is mentioned in a Bangor lease and shown on Raven's Map, but whether the Scots moved to the hills in summer like the native Irish, I cannot ascertain, But it is quite likely "the sarvants" did. Anyway they reared cattle and sheep, hens

*Carew Manuscript 1603-1624. The Lord Uchilttrie (Ochilttrie) some fifty cows, and three score heifers landed at Island Magy . . . and some twelve working mares. Scotch Irish, Hanna (Page 521).

and cocks which were sometimes caponised. All this is clearly shown in almost every lease. As in the lease of David Boid, of the noble family of Kilmarnock dated 1675, "2 fatt Beefs." Mutton were also used as rent, and these were often grazed on the Cunnyboroughs as well as the common. These were important areas and shown near each little town, such as Bangor, Groomsport and Holywood. Holywood had a large one, which is still wild land and is known as the Kinnegar, the name comes from the Conys or Cunnys who lived there. They appear on the lease of land to Sir Hans Hamilton and James Hamilton of Newcastle. "The Cunniborough with the park there to it belonging from the sea to the road . . ." also excepting the Conys, and to keep sufficient grasse for them and not to graze sheep on the said warren."

Hens were kept, these were very important, as the smaller tenants paid a large part of their rent in hens. Two hens were the lowest rent.

When the corn was harvested it had to be ground. So the mill takes a very important part in the Rent Book. The mills all belonged to the Earl who leased them to a chief tenant, such as Patrick Clealand, who "holds by lease from Henry Earl of Clanbrassil, dated ye 2nd of Marce 1668 for 31 years. . . the Watter mill of Bangor with the land and gardens thereunto belonging, with all ye toule and moulter to ye said mills belonging." The rent was £30 per annum, one bole of dog meale and one dozen capons.

Practically every lease includes "suit and service to ye courts and mills." The tenant was obliged to take his grain to be ground at the landlord's mill, usually paying to the landlord the sixteenth part of each boll for grinding and one fourth part of a peck out of each boll to the miller. The other requirement was that the tenant must take any small cases he had to the Manor Courts. These courts had no power to imprison, nor could they fine more than £10. They tried minor cases between tenants and had jurisdiction over markets.

In a lease of 1674 "the Toole & Moulter of ye succan of ye sd mill, except B. Robert & B. Davy, which after ye expiration of ye lease granted to sd W. Crafford and his mortgages paid is to be of ye succan of Holywood Mill." This is the mill at Crawfordsburn.

The inclusion of this mill acreage in the leases laid on the landowner an obligation to provide a mill or mills on their estates for the use of their tenants, and to install in them a skilled miller. The miller made his profit from the Toole and Moulter. "The Toole and Moulter of the succan." The toole or tole and mooter or mulcture which one thinks of as a fine, is the payment to the miller. The Succan is the acreage or Sockan, that being the area from which a miller could expect to draw his customers. They were bound by their leases so to do.

The Earl was sometimes responsible for the upkeep of the mill and sometimes his chief tenants, as when Hans and James Hamilton at Ballywalter Town had "a covenant, if ye main post of ye said wind mill hapen to fall, whereby ye said mill may fall or be blown down, then the reparation be at the charges of ye said H. & J. Hamilton."

The rent for the wind mill was £20 and 3 dozen capons. There was also a water mill in the lease and £5 yearly is to be abated out of the rent and "paid to Mrs. Peacock in consideration of the mill draughts and dams that she suffers to be cut and built upon her land."

There was a fine of 2s. or 6s. 8d. per bushel according to the custom of the manor for every bushel of corn which the tenant had ground at any other mill rather than at his lord's mill. As the miller's mulcture was scarcely half this amount, it would appear to have been to the tenant's advantage to have his corn ground at his own Manor Mill. All the same the grinding at the estate mill was most unpopular, partly because it was often a very long way to go, as at the Holywood Mill where there was a very large

Succan. The native Irish hated the mill ground flour, because they said it was heavy and soggy. The oats ground in the quern were roasted before grinding, to make it easier to grind and perhaps because they preferred the taste. An Act of Charles II declared the hand mill illegal, but no amount of laying down the law could root it out. Bailiffs went round breaking up the querns wherever they could be found which would appear to be the reason why they are so scarce.

As I said before, the Earl or his chief tenant was responsible for having a mill and that in repair, for the tenants to use, but this did not appear to be always the case. In the lease to William Shawe in Slught Neals and Kellys in the Manor of New Comber "To grind all the corne of the premisses at the next adjacent mill or mills of the said Earle, if the said mill or mills be in repair." It was not always the Earl's fault, for the lease "With Thos. Pottinger 1672" says "The corne mill of Owen Quirke, or Owen O'Cork, six acres to ye said mill belonging . . . ye toule and moultier of ye towns of B'macarrett, B'hackamore, Knockcolmkille, B. Cloghan, B. Mechan, B. Miscaa with ye fines payable by ye tenants of ye said towns for refusing to grind their corne at ye said mill." This was a tide mill.* There is a tradition at Killinchy that in the Rebellion of 1641, the miller of Balloo Mill near Killinchy was dragged to the Shillin Hill where he was horribly mutilated and left to die. The hill probably belonged to the mill, being the hill where the corn was held up in a wight, a goatskin, stretched on a hoop, and then slowly spilled from the wight, so that the husks were shelled or blown away.

The settler had to keep himself warm as best he could. There was little timber in North Down or in the promontory of the Ards. Trees are only mentioned twice in leases. "All timber trees excepted in a lease of 1672." "All timber trees and saplings excepted" in another of the same date. These refer to lands on the edge of the forests of Mid Down in the Duffryn.

So the planter had to turn to the bogs or mosses for his fuel. Though there was plenty, it belonged to the Earl or his chief tenants. In this lease to William Crafford dated 1674 "all royalties especially the waies leading to the mosses of B. Leidy and Bangor" shows that it was important to keep the tracks to the bogs open so that the tenants were not committing trespass in order to get their turf. This was not in any way a personal choice for "the said Earle shall appoint his tenants to cutt their turfe in the turfe boge or mosse of B. Keigle." This is in David Kennedy's lease of 1674.

4d. was invariably the amount payable by each man for a day's cutting, the number of days cutting also being stated in David Kennedy's lease, he has 40 daies cutting. "Mosses and turberies that shall be two turfe deep" belonged to the Earl only.

In the case of the Earl's tenants not having a convenient bog, it is laid down in a lease, that of John Hamilton Merct, of 1627, that "he shall and will allow and suffer such of ye said Earle's tenants of ye Parish of Bangor as have accustomedly digged or got their mosse or peats in the mosse belonging to these presents, to have the like liberty, etc. . . . they making noe wast of ye sd Mosse and working the said orderly as it ought to be." In another lease there is a clause to "cast turfe in the said Earle's mosses." It sounds as though they were allowed to dry the turfs in the usual manner, beside where it was cut.

In the Rent Roll of Mount Alexander, in the Montgomerie estate dated 1684, there is no mention of the tenants having turbery rights. The only reference to turf is as in the lease of Thomas McConnell and George Houston 1679 where the leading of ten loads of turf, is entered. This is not for the tenants but is for the lord and part of the rent. In another lease 30 loads are shown.

*See the Raven Maps.

The purpose of all these leases was, of course, production of rents for the Earl, as well as to give stability to the tenant.

There were numerous varieties of rent. Sterling was the main rent and even this could be paid in different ways. Thomas Bradley in 1670 paid 10 pieces of Broad Gold to the said Earl. There were, of course, many types of currency in use in Ireland at this time.

Farm produce came next in importance. A cash payment could sometimes be made in lieu, but it would appear that it was often required as the produce itself. In the lease to John Harris of Bangor Towne, who held two acres of land and one tenement for which he paid as stated "10 shillings in money and 4 bols of oats, 6 hens, and six daies work."

The largest single item of livestock is "a choice fatt Beefe" yearly, or again it could be "the best beast" reminiscent of a medieval church tithe. Cash could be paid in lieu from 20s. to 38s. Then there is the mutton, usually a "fatt" mutton. The taste in meat seems to have changed radically. Nowadays it is always lean meat that the housewife wants. The value is from 5s. to 19s., rather a surprising variation, at almost the same dates.

In the Rent Roll of Mount Alexander, the Montgomeries' estate, sheep are included but only as at Ballyalton in 1680. "Dutys, one shorn wedder." In another lease "one rough wedder." A wedder is a ram, usually a castrated ram. A fat calf is only mentioned once, so apparently they did not eat veal and the cattle were allowed to reach maturity.

A hen is a very common form of rent. The value being 4 pence, a capon was 6d. Hens like capons could be fat hens or just plain hens. Sometimes the statement is made "as required" but more usually no equivalent is given. In a lease dated 1644 at Portaferry House it states, "Three dozen of hennes and three dozen of capons, the one half thereof to be in kind and if so they cannot conveniently get fowles to pay, they are to pay in lieu thereof fioure pence for each hen, etc. . . ."

Rent is also paid in cereals and the measures are stated in a number of ways. Oats in large quantities were to be in "Bristoll bound Barrells" or "Barrells of sufficient Oats of Bangor Measure" such as in the lease to James Maxwell in 1673, "paying yearly 1 pound sterling and forty-five Bristoll bound barrells of Oats all of heaped measure and to be carried not above foure miles from ye said lands." Then there was the bol, bole or bolle. This is a measure of capacity, containing in Scotland and therefore in North Down, 60 imperial bushels. It could also be a measure of weight, i.e., 140 pounds. It varied according to its content. It again is described in various ways as a Kinnigha Bole, that is a Cunningham bol, or "of sufficient well cleaned Barley, Bols of Cleane barley, Bole of corne, or just Bailiffes corne," or "according to custom." The Bailiff seems always to have been paid in corn according to the value of the lease. Who sorted all this out? Probably the Bailiff who thoroughly earned his oats!*

The "daies work" is a very common form of rent also 'Daies work of man & horse.' This is referred to in the description of Elizabeth Shaw's work (she was the wife of the first Earl). At Newtown as described in the "Montgomery Manuscript" when the Montgomeries first settled she had numerous servants, as it says "having then no duty day's works from tenants or very few as exacted." In the Rent Roll of the Manor of Mount Alexander it is mentioned several times, and also as I said before with reference to the "leading of 30 loads of turfe yearly."

*A Scots bol or bolle for wheat or beans was equivalent to four Winchester bushels; for Oats, Barley and Potatoes equal to six bushels.

Two rents never mentioned in the Hamilton Estate and only in the Montgomerie, is a "ffed swyne and a thrieve of straw," that is two stooks of straw containing twelve sheaves each, but of course it varied in different localities

The only indication that prices would vary over the years is in a lease to John Maxwell, 1623. "The said corne to be rated at the best rates at which the corne could be sold."

Tenements seem to be of varying sizes and the rent is almost always 10s. Two higher rents in Ballymegee Street in Bangor might be because they are in a better site but there is nothing to show this.

Inland was at 5s. and Outland at 2s. 6d. per acre. At approximately the same dates 1776 to 1780 the Mount Alexander tenements paid higher rents, a half tenement could be 9s. 9d. or 11s. 9d. per tenement. The values varied considerably and in townlands also they were higher. It is possible that the land near Comber then, as now, was better. These rents all refer to people living in the towns such as Bangor, Holywood or Comber. The country leases nearly always deal in complete townlands.

An interesting point which is referred to twice, is the question of Tenant Right. This as we all know made a great difference to the Ulster peasant; making it worth his while to improve his land and buildings. This must be quite an early reference and it seems rather surprising that the Scottish settlers should have acquired the idea presumably from Ireland. In the lease of 1675 to William Stewart "to be paid for his improvements on the premises not exceeding ten pounds ster., to be adjudged by two indifferent men mutually chosen" and then later in 1714 "Jane McMechan to have her present holding at present rent, surrender her wast tenement . . . in condition of which, she and her family renounce & quit their tenants right."

The most important town in the Hamilton Estates was Bangor. It had been of note for centuries and there was probably a nucleus of rude cabins clustering round the ruins of the ancient Abbey when the Hamiltons arrived. Near this spot James Hamilton built himself a house. The Plantation Commissioners visiting Bangor in 1611 reported "Sir James Hamilton Knt., hath buylded a fayre stone house at the towne of Bangor in the upper Clandeboye, within the Countrie aforsaid about 60 foote long and 22 foote broad. The towne consists of 80 newe houses, all inhabited with Scotysmen and Englishmen." In 1676 the fayre stone house was leased to Randolph Brice, Esq., with the "apertenances & parkes" the Hamiltons having moved to Killeleagh Castle.

The Raven Maps of 1628 show 80 houses and list 44 householders, by 1676 the Clanbrassil Lease Book shows 108 leases. These houses were almost all mud houses, which indeed they were to remain for a long time, for in 1740 a certain Michael Echlin* wishing to sell some houses, tells a likely purchaser that his houses are not built with "mudd" like the rest of Bangor Houses, but built with stone and roughcasted.

At the back of the book are various notes, some unfortunately not dated, but they show that the Hamiltons were trying to improve the appearance, at least of the Main Street. "Mrs. Edwards, Ballymegee Street, Oct. 30, 1717, $\frac{1}{2}$ tenement at 6s. 9d. for three years, to build ye front with stone and ye whole house in a year." Again in B'magee Street, "William McMechan, 1773, a clause in foure years after the commencement to build the half tenement with stone work one story and a half high." This term tenement is variable, I cannot discover whether it refers to a house in an area or only the area. In 1672 or thereabouts, William McCormick " $\frac{1}{2}$ tenement to pay rent after commencing to build his half tenement with a sufficient stone wall." This was at the bridge end, at the bottom of B'magee Street, just where the pedestrian

*Agent to Michael Ward,

crossing now is. Several other people were relieved from paying their rents until their houses were built. Until then they probably lived in the earth and wattle cabins of the original inhabitants. Such houses are shown on the "Sarvants Hill" in Raven's Map of Bangor.

All these houses were more or less thatched "in the manner of the Scots," but there were some slated houses and these are mentioned specifically on Page 49 in the important lease of Mr. Robert Maxwell. He paid a rent of £40, he also rented the quay and anchorage of Groomsport. "One slatt house & garden in Bangor whereon Capt. Maxwell lived" also "a house of 39 foot in ye front in Bangor towne." A number of leases give the right of quarrying stone for the personal use of the lessee, also in one case in the lease to James Moore 1672 "except so much of the Quarries of slate as the said J.M. shall make use of in his or their (that is, his tenants) buildings or houses to be erected."

The two main streets of Bangor have not changed, Ballymagee Street now High Street and Main Street. There were also Suter Row that is Shoemakers Row, Sandgate Street, Back Street and the area of Church Quarter.

All the houses had their tenements of varying sizes. Half tenements or two thirds of a tenement, or a tenement 50 feet in front and 120 feet backwards. Anyway they all seem to have had a little land and some had gardens, such as finley Martin, who leased " $\frac{1}{2}$ a tenement whereon he liveth with a back garden."

There were some amenities, as they might be called. The same finley Martin rented some land "with ye banks and brays adjoining ye bale green" just round the corner from the Customs House, as it is shown on Raven's Map of Bangor.

There was the Mill at the bottom of Ballymagee Hill rented in 1672 by John Swadlin (a factotum of the Clanbrassils). "The slate Corne Mill of B. Maconnell also the mill pond and dams of ye soil on which ye mill standeth." He also leased six score acres of Ballyholme.

There was a market place, because Hamilton had a licence for markets in Bangor, Holywood and Ballywalter, where Wid. Gregg "holds one little house in ye market place" is. There must also have been a pound, but this again is only mentioned in Ballywalter town where "Thos. Duggan holds one plott of ground neare the pound."

At Bangor there was a School House, for "Jo. Gowdy School maister of Bangor holdeth 2 acres of land in the Church Quarter and one garden plott and road of land neare the school House also enjoyed by ye said Gowdy." As no rent is mentioned this would be his salary or part of it.

A kill or kiln was most important and they seem to have been pretty common. Unfortunately we are not told whether they are corn drying kilns or lime kilns. It is likely that judging from the number they were corn drying kilns. "The Kill Hill by the mill lead just at the top of Ballymagee Street. Alex. Wilie 1655 2 tenements in B'magee Street, also ye Kill stead and land belonging thereto."

The tack mill of B'Home was rented by Mr. Robert Maxwell. This was for finishing cloth.

The Kirk Hill is the only reference to the Abbey Church, and no Rector is mentioned as such, but in Page 90 is a lease of Thos. Ffergison beside which is a note in the margin which says "9 in Mr. Ramseys freehold deed." Mr. Ramsey was probably the minister who was deprived of the living in 1661.

There was the Cunnywarren of Bangor stated as being "now Wast." Also "The Ferry boat formerly held by Wm. McMechan at one pound, to be enquired after." This is a note at the back of the book. There was, according to O'Laverty, a ferry still plying in 1539 between Bangor and Carrickfergus. It was owned by the Abbey of Bangor, so this was probably its descendant.

The Customs House, still standing on the water front with its strongly marked Scottish feature of the crow stepped gables, was built by James Lord Viscount Claneboy. He must have started it after 1625, for Raven does not show it in his map of Bangor. It was still under construction in 1637.

Mr. Swadlin already mentioned as the owner of a slated house in Ballymagee Street had it on a freehold lease. "Mr. Swadlin executors holdeth ye Custome House of Bangor during the remainder of ye lease Mr. Swadlin had from Henry Earl of Clanbrassil." I should think it must have been quite a lucrative holding.

The quay of Bangor is not mentioned, probably the Hamiltons kept the dues to themselves, but a quay is mentioned in a lease to Thomas Scott of Ballywalter dated 1675. "When the key of Ballywalter shall be built to double his rent for the tenements." Ballywalter seems to be quite a place as it again is the only one where a "Smithy" is entered. "W. Byers holdes one smithy paies one shill per annum."

The people whose names are entered in the Lease Book appear to have many descendants in Down, Belfast and the surrounding districts. I can find only five names not in the current telephone book.* The Hamiltons themselves intermarried with the local gentry and their descendants were numerous. The old Vicar of Dunlop had six sons, and James first Lord Claneboy settled them all on his lands. There were others who were distantly connected such as John Bailie of Inischargy who married the widow of Alexander Sloan, father of Sir Hans Sloan. He with James Moore was trustee for the Sloan children. This is shown in a lease of 1671 of the Townland of Rowreagh and two other townlands in the Ards. He was by some people considered a shady character as he supported the Lady Alice in her nefarious plots. Anyway the author of the Hamilton Manuscript did not like him.

Hugh Kennedy of Bally Cultra, Doctor of Physiche, in 1675 leased huge tracts of land reaching from Holywood over to Dundonald and as far as Ballybeen. He seems to have practiced in spite of being a landowner, for in the Montgomery Manuscript it says "This Earle, 2nd Earle of Mount Alexander was long and dangerously sick of a surfeit (as was supposed) of fruit, and was cured by Dr. Kennedy."

Then there was Ninian Tate of Ballybeen who appears to have had Presbyterian leanings, for he "holds a tenement whereon the Preaching House stands 5s. per annum." His name is recorded in the Kirkdunald Registers, as a Witness at a baptism on June 11th, 1681. The entry is as follows "David Tait had a son baptised John. Witness Ninian Tate and All. Taite."

Probably they were grandparents.

*These names are the undernoted:

Ginly
Merhan
Pottinger
Stainhouse
Swadlin

8th March, 1966

DOWNPATRICK, THE MEDIEVAL CITY

R. C. PARKINSON

The Barony of Lecale, in the County of Down, is in shape a rough semi-circle, the diameter extending in a south-westerly direction from Strangford Lough, up the estuary of the Quoile River, thence through flat lands all below the fifty foot contour to the Blackstaff River, thence by the Inner Bay of Dundrum to the open sea. The curved boundary is formed by Dundrum Bay and Strangford Lough, so that the territory is, even yet, to some extent, isolated from the rest of the country.

About half way along the diameter rises a little hill, almost surrounded by marshy land, which, till the erection of a barrier little over two hundred years ago, was inundated by the tide, the end of a ridge extending from Strangford. It is a position easily defended against predatory animals or equally predatory man, a typical site for a settlement, near a river crossing.

Excavations carried out shortly after the War have revealed eleven different layers of settlement from the late Stone Age onwards, and recently, in developing a new housing site a Bronze Age settlement was discovered on the low ground just above the old high water mark.

At the beginning of the year 1177, this hill was crowned by the Great Church of the Holy Trinity, staffed by Canons regular under the Rule of St. Augustine, placed there by St. Malachy in his reforms of some forty years earlier. Hard by, the Church of St. Brigid "in the midst of Dun-de-lethglas", and the "Curia" of St. Columba, with the attendant dwellings of the clergy and dependants of the monastery. Not far away, is the fortified residence of the local petty king, Ruadri Mac Duinn Sleibhe, and dotted throughout the country side, similar homesteads of the inhabitants.

Here, then, early in February, John de Courcy, with a force of twenty-two men-at-arms, and three hundred auxiliaries, both Norman and Irish, on the fourth day of his march from Dublin took the place by surprise and captured it, Giraldus says, without resistance. Within ten days, the inhabitants rallied under Duinn Sleibhe, but were repulsed. In another attack, about Midsummer, allied with the Cenel Eoghan, they were decisively defeated, and for twenty-five years, de Courcy was to have peace in his new conquest, which he speedily expanded to cover the present Counties of Down and Antrim. These he protected by motte and bailey fortifications at strategic points. He appears to have been loyal to the throne, but set up his own practically independent administration, with his seneschal, chamberlain, constable and other officials.

During his peaceful rule, he undertook a considerable building programme. He undoubtedly began, and may well have finished, the castles of Carrickfergus and Dundrum, and his townships of Down, Carrickfergus and Newtownards; his new Cathedral of Down which he caused to be dedicated to St. Patrick, St. John's of the Irish for the displaced Irish canons, St. John of the English, and St. Thomas the Martyr—orders charged with the care of the sick and elderly, all in Down. Inch Abbey for Cistercians, Blackabbey in the Ards, while his wife built Greyabbey. There is a long-standing tradition that he also built a castle in Down. While this is more than likely, it has vanished so utterly that its very site can only be conjectured. The earliest plan of the town, which is as late as 1729, shows Castle Quarter as lying between the present Bridge Street, English Street and Irish Street.

One of his early charters, granted some time after 1183, was to the Church of the Holy Trinity of Down—not, of course, the Cathedral, but probably the chapel in which, according to Pembridge, he places the "image" of the Trinity he had removed from

the Great Church. This comprised "the land on the right hand entering St. George's Wall as far as the Curia of St. Columba, and from the Curia of St. Columba by the street beside the Cross of St. Monnina as far as the wall and Mungona . . ." This at least suggests that his township was taking shape, and was walled.

On his accession to the throne, King John set himself to continue his father's policy of making himself king in fact, and no mere "primus inter pares". De Courcy had remained loyal to the throne, and had even been permitted to coin money in Down—a royal prerogative, but he was soon to fall under the King's displeasure, probably because, alone among the barons of Ireland, he held no patent from the Crown, and possibly, as has been asserted, because he favoured the cause of Arthur of Brittany. In 1202, de Courcy was summoned to the King's court, but he failed to comply. The King stirred up his great rivals, the de Lacys, who defeated him in a battle near Down, and banished him from his lordship. Again he was granted safe conduct, and gave hostages. Again, de Courcy continued recalcitrant, and in September he was captured by de Lacy, but released on undertaking to be "crossed to go to Jerusalem". Instead, he fled to Tyrone to take refuge with O'Lochlan, a relative of his wife. This was final; the forfeiture was deemed complete, and on 29th May, 1205, all his lands were granted to Hugh de Lacy, who, at the same time, was created Earl of Ulster by the King. De Courcy appealed to the Pope, and with the aid of his brother-in-law, Reginald, King of Man, and a fleet of one hundred ships, landed at Strangford, and laid siege to the Castle of Dundrum. He failed, and the besieged garrison was relieved by Walter de Lacy.

But the turn of the de Lacys was to come; King John subdued Wales, forced William the Lion of Scotland to pay him homage, and defied the Pope. Then he turned his attention to Ireland. His immediate object was to capture William de Braose, who had fled on John's demanding hostages, and who, very possibly knew more about the death of Arthur of Brittany than the King cared to be known.

John landed in Ireland in June, 1210, with a well equipped army, and seized the lands and castles of all who favoured de Braose, including Walter de Lacy, who was his son-in-law. He encamped at the Mead, near Dun, on Friday, 16th July—a spot still known as Kingsfield, and pressed on to Carrickfergus, which he speedily captured, with many of de Lacy's adherents, and despatched John de Courcy and Geoffrey de Crancumbe to capture the Earl of Ulster—which they did before the King left Carrickfergus. How ironic if it were indeed the same John de Courcy whom the de Lacys had expelled a bare five years earlier!

The lands of the Earldom were taken back into the King's hands, and given in charge to Roger Pipard as seneschal. He rendered his account for the 13th and 14th John, including 1,000 coombs of flour for the thirteenth and 1,042 for the fourteenth year from the fixed rents of the small manors of Ulster, and 120 coombs from Ballydugan for the fourteenth year. (A coomb equalled four bushels.)

King John was forced by his barons to grant Magna Carta in 1215, and the following year he died. Under the minority of his successor, Ulster lapsed into chaos. In 1220, the Prior and Convent of St. Patrick's of Down (the Cathedral) sent one of their monks to the King, with the shrine containing the relics of the Patrons of Ireland, Patrick, Columba and Brigid, begging some small dwelling in England in which, when need be, they might lodge, for the Monastery of St. Patrick, with the Church, had been frequently destroyed and burnt during the wars, and had just begun to be entirely rebuilt.

The wars continued: de Lacy sought to regain his territories by force of arms, and was eventually restored to his Earldom, 20th April, 1227, on payment of a heavy fine. He appears to have held his lands in Ulster in comparative peace, and is said to have introduced the Franciscans and Cistercian nuns to Down.

Hugh de Lacy died about the end of 1242, leaving an heiress, but the lands of Ulster were taken into the King's hands, who granted them to his son, Prince Edward in 1254.

The steady spread and consolidation of Anglo-Norman power over the greater part of Ireland forced the Irish chieftains to the conclusion that their only hope lay in abandoning their inter-necine feuds, and in some form of union. In 1258, Aedh O'Connor and Taig, son of Conor O'Brien, King of Thomond, met Brian O'Neill at Caol Uisce on the Erne, and acknowledged him as High King of Ireland. In 1260, Brian and his allies marched against Down and were completely defeated by the citizens. Brian himself was killed, and many of the chief men of Ulster and Connaught.

Martin, Prior of St. Thomas's of Down, Sir Roger de Altaribus and Roger le Tailleir, Mayor of Down, hastened to the King to report their victory. They besought the King to prevail upon Prince Edward to confirm the liberties of the Prior's church, to relieve the citizens and commonalty from the payment of 100 shillings rent a year in order that they might enclose the town, to confer in fee upon the knight aforesaid, some land in Twescard which had fallen into the King's hands by the death in battle of the Irish chieftains, and to grant the Mayor some relief regarding 23 marks and 40 pence of rent. The three messengers were granted 10 marks of the King's gift for their expenses in returning. Prince Edward granted Sir Roger the lands of O'Haughian in the County of Culrath, and to the Mayor the villis of Ardglass, Ardtule and Ross.

Shortly before 1264, Prince Edward granted the vacant Earldom of Ulster to Walter de Burgh, in exchange for lands in Munster.

Earl Walter ruled Ulster with a strong hand, and died in 1271, little more than forty years of age. His son and successor was then about twelve years old, and William Fitzwarin was appointed Seneschal of Ulster. Henry de Mandeville, whom the Lord Edward had made his bailiff in Twescard broke out in rebellion, and raided Down, where he slew, amongst others, Manus O'Kane.

De Mandeville was checked for the time, and at the end of 1276, Fitzwarin, accounting for less than two years previously was able to return

From the Manor of Down	...	...	...	£76	9	7
From the farm of Ulster	...	...	...	£608	16	0½

Earl Richard de Burgh came of age in 1280, and one of his first actions was to replace Fitzwarin by Thomas de Mandeville and to seize Fitzwarin's land and chattels to the value of £600. Fitzwarin went to Dublin, where he made his peace with the Earl, who granted him a letter directing Thomas de Mandeville his Seneschal, to restore his goods. De Mandeville refused, and imprisoned Fitzwarin, who eventually escaped to Dublin to seek a remedy from the King's Council. A writ was issued under the Great Seal of England to John de Saunford, Escheator of Ireland, who held inquisition in the Vill of Down, with a jury of thirty-three of the magnates of Ireland, where de Saunford associated with himself, Nicholas, Bishop of Down. This suggests that there was a hall of some size where the inquisition could be held, perhaps in the castle, or, as the Bishop was associated with the Escheator, in the Cathedral.

Fitzwarin claimed that his losses and those of his tenants were about 1,500 cart horses, oxen and cows, 130 horses and mares and 2,300 two year old hogs and goats. 400 crannocks of oatmeal were destroyed; his salt pan, worth two marks was destroyed, whereby he lost 104 crannocks of salt a year.

De Mandeville pleaded that the case should have been heard in the Earl's court, and with this the Escheator agreed, granting however, Fitzwarin the right of appeal to the King if he could not come to an agreement with the Earl. The parties made oath before the Bishop of Down and the Escheator, and gave sureties.

The germ of parliamentary institutions arose in England in 1265, and in 1297, a Council of all the magnates of Ireland was held, to which were also summoned two

elected knights and the sheriff of each county or liberty; the towns, the lesser clergy and the native Irish were not represented. At this Council Ulster was declared to be a county, with a sheriff of its own, and that the sheriff of Dublin should no more interfere in Ulster. In 1310, Ireland's true model Parliament was held at Kilkenny, to which the magnates were summoned in person, together with two knights from every shire, two citizens from every city, and two burgesses from every burgh. Several names of Ulster association were recorded, and one might perhaps hazard the guess that one representative of the City of Down was Thomas le Tailleux.

Edward I was mainly concerned with affairs in France, Wales and Scotland, but in 1300 he made plans for an invasion of Ireland; among Irish ships for the transport service was the "Mariote," of Drogheda, David of Down, master. The ships were supplied by the owners free, while the King paid to each master 6d. a day, and 3d. per day to each man.

Some light is shed on the trade of the country by a case heard before the Justiciar at Swords, on the Vigil of St. Martin the Bishop (10th November) 1306. A ship, the "Nicholas" of Down had been wrecked at Kilmarnock. Some of the merchants and sailors were drowned; others struggled ashore, and aided by some of the inhabitants succeeded in salvaging part of the cargo of wines, coffers of jewels, copper pots, spices in barrels and other goods. John le Long, of Malahide, was charged that he took three lambs' furs, a hood of green cloth and a barrel full of spices of great value. Also that he and his associates drank and destroyed of the salvaged wine. He was ordered to restore the goods to the seamen and merchants, and to pay a fine (the amount obliterated) to the King.

The last of the Christian Army was driven from the Holy Land by the fall of Acre in 1281. Pope Nicholas caused an assessment of taxation for a further Crusade, the accounts of which have survived. In the Deanery of Lecale were forty-three churches, and in the Barony of Lecale itself about as many as there are places of worship of all denominations to-day, suggesting that it was then closely settled, with a population approaching that of to-day, or even of our grandfather's time.

Anglo-Norman power in Ireland had now reached its height. The Earl of Ulster held sway from his new castle of Northburgh, at Greencastle in Inishowen to Greencastle in Mourne; his lines of communication with Dublin were secured by King John's Castle in Carlingford and the borough towns of Dundalk and Drogheda. His power extended over Connaught, which was largely held by his relatives. Similar magnates held sway over the greater part of the country, and corporate towns and castles at strategic points secured their power. Appeals were reaching the King's Courts in Dublin from distant Kerry and Clare.

Robert the Bruce's victory at Bannockburn ensured the defeat of England's attempt to dominate Scotland, and the native Irish sought his aid. Bruce's brother Edward landed at Larne towards the end of May, 1315, and for three years ravaged Ireland with fire and sword. He is said to have been proclaimed King of Ireland at Down, where he sacked and burnt the cathedral. As the Scots army lived on the country till his defeat and death at Faughard, near Dundalk, he left the country desolate. The Annals of Ulster describe him as the destroyer of Ireland, both foreigners and Gael; his slaying "not from the beginning of the world a better deed for the men of Ireland. For there came dearth and loss of people during his time in Ireland in general for the space of three years and a half, and people undoubtedly used to eat each other throughout Ireland".

Although the Anglo-Normans rallied, their power in Ulster was to receive a shattering blow. Aedh Buidhe ua Niall was driven out of Tyrone in a dynastic feud and proceeded to carve out a new domain, driving a wedge between Carrickfergus and the Ards and Lecale, and gave his name to the district of Clondeboy.

Richard de Burgh, the "Red" Earl of Ulster, died in 1326, and was succeeded by his grandson, William, the "Brown" Earl, a lad of fourteen. William was knighted and given seizin of his lands in 1328, while still under age. He married Maud, daughter of Henry Plantagenet, 3rd Earl of Leicester, a great grand-daughter of Henry III, and therefore a distant cousin of the King. He was assassinated at the Ford of Belfast in a family feud; his young wife with their infant daughter fled to England, never to return. This daughter married Lionel, Duke of Clarence, second son of Edward III, and by marriage of heiresses, the Earldom of Ulster passed to the Duke of York and through him to the King Edward IV. This descent is neatly set forth in Shakespeare's "King Henry VI, Pt. II, Act II, Scene 2."

An Inquisition into the vast possessions of the Earl of Ulster was taken at Antrim, 3rd July, 1333. This includes:—

At Dunn is a Borough Town, the Burgesses of which pay £2 for their Burgages.

At Ballydugan is a water mill, worth £1, let to Roger de Ethreslee for 28 years.

A County Court held at Dunn monthly, the pleas and perquisites of which are worth 10s.

A number of free tenants are listed, and a few of the names still occur in the district.

Lionel, Duke of Clarence became Lord Lieutenant in 1361, and set himself to recover the lands of his wife, Elizabeth, heiress of the Earldom of Ulster, and other vast possessions of de Burgh throughout Ireland—a policy resented by both the native Irish and the Anglo-Normans, who resented the conveyance of lands in Ireland by the marriage of heiresses in England.

The Crown appointed its officials for the administration of Ulster. In 1375, John Fox became Collector of Customs, as well great as small, in the ports of Carrickfergus, Coleraine and Down; Walter Scolmaistre of Carrickfergus and Robert Savage were appointed Controllers of Customs in the same ports.

King Richard II in 1389 assumed full power, casting off the domination of certain magnates of England who had held power during his minority. In 1394 he led an army to Ireland and received the homage of the Irish chieftains. He was accompanied by Roger (Mortimer) Earl of March and of Ulster, whom he appointed Lord Lieutenant in 1395. Roger was slain at the Abbey of Kells, 15th August, 1398, and the following January Richard again landed in Ireland. On both occasions one of the leading magnates in his train was Janico Dartas or D'Artois, said to have been a Gascon. One of that name was certainly Provost of Bordeaux. He seems to have had links with Lecale, for among his possessions were Ardglass, Ardtole and Ross, by the gift of Sampson Dartas. In 1333, one Richard Dardiz held Ballyorgan. Janico was faithful to King Richard throughout, and on the usurpation of Henry IV, was imprisoned in Chester, but was shortly after released, and sent back to Ulster as Seneschal. He married about 1403, Joan Taafe, widow of Peter Rowe, and heiress of lands in Meath and Ulster. There are records of Taafes associated with Rathmullan at this time.

Under D'Artois, the English of Ulster rallied. A number of castles were built, of which Kilclief was the prototype. Letters of protection were granted to the Mayor, Baillifs and Citizens of the City of Down in 1405. With the aid of a grant from the King, the port of Ardglass was developed, and a range of warehouses, known as the "New Works" built.

Attacks by the O'Neills of Clondeboy, McDonnells of Antrim and the Magennisses of Iveagh continued. In 1420 a petition was addressed to the Earl of Ormond, Lieutenant of the King. It was dated at Down, 4th June, 1420, and set forth that Magennis was destroying and wasting the country, had slain many gentlemen, had

twice burnt the City of Down, contrary to his oath, and had destroyed Greencastle and Carlingford. The petition was attested by the seals of the Chapter of the Cathedral, of the Community of the City of Down, and of the Vill of Ardglass. Sir Janico died about the end of 1426, leaving a considerable estate in Lecale and elsewhere in County Down, which passed eventually by the marriage of an heiress to Gerald, 8th Earl of Kildare. Thus the great House of the Geraldines got a foothold in Lecale, where they are still represented by their descendant, the Baroness de Ros.

In the absence of the Earl of Ulster, the most powerful man in Down was undoubtedly the Bishop, not merely for his spiritual powers, great as they were, or his ecclesiastical court, taking cognisance of matters testamentary and matrimonial, but by virtue of his office he was a great landlord as well, having judicial powers over his tenantry, saving the four pleas reserved in Leinster—rape, arson, coining and breaking and entering after sunset. One John Cely became Prior of the Cathedral in 1412, and Bishop the following year. For a time, he discharged his duties efficiently, and in 1425 was appointed Chancellor and Treasurer of the Liberty of Ulster. In 1434, the Primate wrote to him admonishing him for his association with one Lettice Thomas in his castle of Kilclief and Manor of Bishops court, and in 1441 he was deposed for this, for his appearing in a habit other than that of his Order, and for issuing decrees contrary to the interests of the Primate. It has been suggested that Cely was a Lollard, but this seems unlikely, as the House of Lancaster leaned heavily on the Church for support, and indeed, initiated the persecution of the Lollards. It seems more likely that as many others exercising power, he did not feel himself bound by the rules binding lesser folk.

The King, with the approval of the Pope, united the Sees of Down and Connor, on account of the poverty of each. The Primate protested, on the grounds that Down was a "civitas regia", and that the union would be prejudicial to English interests in Ulster, but the union of the Sees was accomplished.

King Henry V died in 1422, and his son and successor, King Henry VI proved quite incapable of controlling the turbulent houses of York and Lancaster, hence the Wars of the Roses, which only ended with the victory of Henry Tudor at Bosworth in 1485. A record formerly in the Tower of London puts the final loss of Ulster to Richard, Duke of York, who through his mother, Anne Mortimer, was Earl of Ulster. He had served as Lord Lieutenant of Ireland in 1449 and 1459, and during his rule had "so gained the hearts of the Irish nobility that divers of them, especially those of Ulster, Clondeboy, the Glinn and the Ards, which at that time were better inhabited with English nobility than any part of Munster or Connaught, came over with him against King Henry VI, to wit, famous battles as to Bloreheath, Barnet, Northampton and lastly to Wakefield, where they not only lost their lives with him, but also left their country so naked of defence that the Irish cast up their old captain, O'Neale, relied themselves with their ancient neighbours the Scots, and repossessed themselves of almost the whole county, which is the utter ruin of Ulster".

Sometime about 1490, a most grievous petition was addressed to King Henry on behalf of all the faithful and true lieges of the Earldom of Ulster, "some time named as the third most Royal Earldom in Christendom". This document bore the seals of the Bishop of Down and Connor, the Prior of Down, Archdeacon of Down, the Abbots of Inch, of Saul, of Bangor and of Greyabbey, of the Master of St. John Baptist's of Down, of George Russel, Baron, and of the commonalty of the City of Down, and of the towns of Kilclief and Ardglass. Unfortunately, as in the case of the petition of 1420, the seal of Down has long disappeared.

Tiberius Ugolino, an Italian from Viterbo, was consecrated at Rome for the See of Down and Connor, 12th March, 1489, and ruled over the See till his death in 1519. In 1512, he suppressed all the surviving religious houses in Down, except the

Franciscan Friary; the rectory of Ardglass, the Prebend of Ros, the Prebend of Ballengolbec, and the chapel of St. Mary Magdalene, and applied their revenues to the maintenance of the Cathedral, "that it is better to endow the Cathedral Church than that each should go to ruin". This suggests a very considerable depopulation and impoverishment of the country.

About this time, a letter from Cardinal Chiericati to Isabella D'Este, of Ferrara, Marchesa of Mantua throws some light on life in Ireland at the time. He had come as Papal Nuncio to King Henry VIII and his Queen, Katharine of Aragon, and on the completion of his mission, decided to visit St. Patrick's Purgatory, and other wonders of the land of Ireland about which he had heard so much. Writing from Middleburgh, in Zeeland, he gives a detailed account of his journey by Chester to Dublin, and from thence to Lough Derg. He mentions Clogher "a walled city which is full of thieves", and has a similar comment to make about Omagh. He gives a fairly detailed account of the Purgatory, where his companions made a station of nine days, while he remained ashore. The party returned by the same route to Newry, where "after visiting the Abbey of Verdolino travelled thirty-four miles further to a city on the sea called Don, where I found a bishop who comes from Viterbo, an old man of 114 years. His Church contains the bodies of St. Patrick, St. Brigid and St. Columba, and here we made a station of three days on our pilgrimage. In this place I could not walk about the streets without being pursued by people, who came rushing out of their houses to kiss my clothes when they heard I was the Pope's Nuncio, so I was forced to stay at home. Such is the annoyance which arises from over much religion. But the good old Bishop treated me very kindly, and gave me some excellent fishing. Here fish are so plentiful that you can buy a salmon of 50 lbs. which would be worth a great deal in Italy, for a single penny".

King Henry VIII engaged in no adventures, but set himself to consolidate his power in England, and accumulate a vast amount of treasure. Ireland he left largely to the rule of the Great Earl of Kildare as Lord Deputy, who was succeeded on his death in 1513 by his son, the 9th Earl. The latter was awarded the customs and due of the ports of Ardglass and Strangford as a reward for his services against the O'Mores and O'Reillys. In 1637, when these were redeemed by Charles I, they were said to be worth £5,000 a year.

The state of Ireland was chaotic; the country was in the hands of some ninety chieftains, each of whom made war at his pleasure. Report after report was made to the Crown, and in 1521 the Earl of Surrey reported that the only solution was a complete reconquest. Eventually, in 1534, the King's hand was forced. He had summoned the Earl of Kildare to London to give an account of his Lord Deputyship, and on a rumour of his execution, his son "Silken Thomas", broke into open rebellion. He was at first fairly successful, but Sir William Skeffington was sent over as Lord Deputy, with a new factor in Irish affairs—a train of heavy artillery, with which he speedily battered Kildare's castle of Maynooth into submission. Silken Thomas shortly after surrendered, and was sent over to the Tower with five of his uncles. All six were executed at Tyburn on 3rd February, 1537, leaving of the Great House of Kildare but one survivor, a lad of ten years of age. Lord Leonard Grey was sent over as Lord Deputy to capture the lad, who was smuggled from hand to hand and eventually escaped to France. In his pursuit of the lad, Lord Leonard Grey raided Down and burnt and pillaged the Cathedral. According to Holinshed, he shipped his loot together with the great peal of bells, but the vessel with its precious cargo was lost at sea.

On the downfall of the great House of Kildare, King Henry caused the Irish Parliament to pass acts declaring him to be Supreme Head of the Church and King of Ireland. He sought to enlist the support of the great chieftains by inducing them

to surrender their lands in return for a re-grant under English law and their creation as peers of the realm. To a family like the O'Neills of Tyrone, which had ruled the territory for over a thousand years, and who had never accepted Anglo-Norman domination, a mere peerage was as nothing compared with the ancient title and privileges of The O'Neill. Shane O'Neill, "the Proud", who became The O'Neill in 1559, declared that his ancestors had been Kings of Ulster and Ulster should be his. He was summoned to the Queen's presence in London at the beginning of 1562, and was received with favour, returning to Ireland after a stay of some four months.

He extended his power over the greater part of the North of Ireland as far south as the Boyne. He attacked the O'Donnells in 1567, and was defeated at Farsetmore on the Swilly, and taking refuge with the Scots of Antrim was murdered in a drunken brawl. In one of his many raids into Lecale, he threw down the walls of Down, which had been built or strengthened after the defeat of his ancestor, Brian, just three centuries before.

Shane was succeeded by his second cousin, Turlough Lyneach, and in 1568 Hugh O'Neill was sent over as Baron of Dungannon as a counterpoise. Hugh was the surviving son of Matthew, Baron of Dungannon, and son of Conn, who had been created Earl of Tyrone, but whom Shane had declared to be illegitimate, and whom he slew in 1558. Hugh appears to have been reasonably loyal to the Crown, and served with distinction against the rebel Desmonds in Munster. In 1585 he attended Parliament as Earl of Tyrone, but apparently resented the steady growth of central power, and especially the division of Ulster into shire land. He extended his influence over the magnates of Ulster, and built up an efficient fighting force. The royal troops as a rule were inferior. Service in Ireland was not popular; they found the climate trying, and there was no prospect of loot which made service on the continent more attractive. Moreover, for lack of volunteers, forces were raised in England by conscription and were only too often of inferior quality.

By the end of 1594, the Lord Deputy reported that Tyrone had drawn to himself all the chief lords; her Majesty's loyal subjects had been forced to abandon their countries, and of all Ulster no part stood for the Queen but Carrickfergus, Newry, Monaghan, Enniskillen and the Blackwater.

O'Neill was formally proclaimed traitor in the English and Irish languages at Dundalk, 23rd June, and at Newry, 26th June, 1595.

For five years, Lord Deputy after Lord Deputy sought in vain to subdue O'Neill. On 9th September, 1596, Christopher Russell, Sheriff, and Walter Fitzgerald reported that Lecale had been over-run of late, first by Brian McArt McBaron, about 12th August; five days later by Sorley Boy, carrying off the Savages with their goods, and also making prisoners Simon Jordan, Constable of Ardglass and Rowland Bethell. Within another three days, the town of Down was sacked by McCartan and Glasny McAgaholy. Two days later another town was sacked and Owen McHugh McNeill swooped down to seize whatever was left. So wasted was Lecale that the following year, Sir Geoffrey Fenton, reporting from Dundalk on supplies said that the Lord Deputy had sent into Lecale for 200 head of cattle, but he doubted if so many could be found in that wasted country. In July, 1598, Sir Henry Bagenal was sent to attack O'Neill, but, meeting him at the Yellow Ford, on the Blackwater about two miles from Armagh, was utterly defeated, and slain in the battle. All Ireland, outside the walled towns, now lay at the feet of O'Neill, and by the end of the year, his forces amounted to some 30,000 foot and horse.

In June, 1599, Sir Ralph Lane reported to Essex that Magennis had seized upon all the boats in Lough Cuan, and transported into the lesser Ards 300 foot and 60 horse to attack the Savages, and to hold Strangford Lough for O'Neill. A convoy

of Scots vessels had landed in Dundrum Bay and Strangford munitions, morions and swords.

Essex, like his predecessors, failed, and was succeeded by Sir Charles Blount, Lord Mountjoy. He sent Sir Henry Docwra, with 4,000 foot and 200 horse to build a fort at Derry, to form a bridgehead into Tyrone's and O'Donnell's territories, and to intercept supplies of munitions from Glasgow. For the rest of the year 1600 Mountjoy contented himself in containing Tyrone in Ulster, while stamping out the embers of rebellion in Leinster, as his agents did in Connaught and Munster.

Finally, on 15th June, 1601, Mountjoy marched from Newry, and encamped in Iveagh, Magennis' territory, thence he sent Sir Richard Moryson with six companies of foot and one of horse to make a night march into Lecale, where he came up on the rebel forces by surprise, took all the prey and captured Down, a ruined town. On the 16th, Mountjoy with his main forces marched to the Blackstaff River, where Phelim McEver Magennis submitted and yielded up the Castle of Dundrum to the Queen. Next day, Mountjoy rode to Downpatrick, and thence by St. Patrick's Wells to Ardglass. On the way, a sharp skirmish near Bishopscourt was the last action of the campaign, commemorated to this day by the title Mountjoy Hill.

Meanwhile, a Spanish force had landed at Kinsale, and Mountjoy hastened south to meet it. O'Neill and O'Donnell evaded and outmarched royal forces sent to intercept them, and in turn invested Mountjoy. O'Neill launched a surprise attack before daybreak on 24th December, 1601, but lost the advantage of surprise. The Spaniards in Kinsale failed to co-operate, and Mountjoy won a decisive victory. This was the end. O'Neill retreated to the north, and although he held out still longer, he finally surrendered to Mountjoy at Mellifont, 30th March, 1603. So went down in ruin the last attempt to break English power in Ireland and restore a Gaelic policy. Queen Elizabeth had in fact died a week earlier, and James VI and I succeeded, for the first time uniting England, Ireland and Scotland under one king.

Although the war had been waged ruthlessly, and the country ravaged, recovery was fairly quick. Captain Josias Bodley, Mountjoy's Chief Engineer and Trench Master at Kinsale has left an account of how he spent Christmas, 1602, in Down with his old comrade, Sir Richard Moryson:

"When we had approached within a stone's throw of the house, or rather palace, of the said Master Moryson, beheld forthwith innumerable servants, some light us with pine lights and torches because it is dark, others as soon as we alight take over our horses and lead them into a handsome stable where neither hay nor oats are wanting. Master Moryson himself leads us by wide stairs into a large hall, where a fire is burning the height of our chins, as the saying is, and afterwards to a bed chamber prepared in the Irish fashion. . . . We sat as if rapt and astounded at the variety of meats and dainties. How can we now tell of the sumptuous preparations of everything? How about the dainties? How about the suppers? For we seemed as if present at the banquet to which Cleopatra had invited her Antony. So many varieties of meats were there, so many kinds of condiments about every one of which I would willingly say something only I fear being tedious. I shall therefore demonstrate from a single dinner what may be imagined of the rest. There was a large and beautiful collar of brawn with its accompaniments, to wit, mustard and muscatel wine; there were stuffed geese; there were pies of venison and of various kind of game; pastries also, some of marrow with innumerable plums, others of it with coagulated milk such as the Lord Mayor and Aldermen of London almost always have at their feasts, others which they call tarts of various shapes, materials and colours, made of beef, mutton and veal. I do not mention, because they are vulgar, other kinds of dishes, wherein France much abounds, and which they designate kickshaws. Neither do I relate anything of the delicacies which accompanied the cheese, because they would

exceed all belief. The feasting was kept up till two hours after midnight, when the party broke up; four of the guests were Irish gentry who had each five or six miles to go home."

So a new era dawned for Ireland, for Ulster and for Down. The town survived as the county town, but Sir Arthur Chichester's foresight in building his new town on the Ford of the Farset, where previously had been only a tumble down castle with a few mud cabins huddled under its walls, was justified by the growth of this City of Belfast.

14th March, 1967.

HISTORY OF THE BELFAST GRAIN TRADE

E. R. R. GREEN, M.A., D.Ph.

The grain trade is not easy to define as it covers a vast number of commodities and is both a branch of commerce and of manufacturing. Dealing in a staple food of both human beings and livestock, the trade is concerned with both flour and provender milling and supplies the bakeries. Grain is also the raw material of the brewers and distillers. At one time, the supply of forage for horses was an important part of the trade. It can be seen then, that it covers a wide range of activities with no very obvious relation to each other.

The growing of grain and the exchange of surpluses is one of the oldest of human activities. In the past, the main reliance was on local supplies and the threat of actual hunger through shortage or accompanying high prices was accordingly very real. The problem arose chiefly from inadequate land transport, but supplies of grain could be carried over very long distances by sea and navigable rivers so that the international grain trade is also of great antiquity.

The modern trade, which is a truly international one, is not much more than a century old. Like the other great commodity trades, it owed its origin to the steamship, the railway, and the telegraph which made it possible to bring together sellers and buyers without regard to distance and to organise markets for that purpose. The extension of settlement and cultivation into vast areas of North and South America and Australia combined with a great growth of urban and industrial populations provided the basis of a new trade. It should be pointed out that this division of labour on an international scale realised in a very full degree the theory on which free trade was based. Freely convertible currencies under an international gold standard and relatively free trade were indeed essential to the commodity trades as they existed before World War I.

The replacement of local or national markets by an international one had a revolutionary effect on manufacturing. The host of country mills, grinding with stones and in the main driven by water-power, faced the competition both of imports and of large port mills equipped with advanced machinery. The consequence was that the milling industry was concentrated in larger units and fewer firms.

The purpose of this paper is to relate the grain trade of Belfast to this background and to concentrate in the main on the period between about 1879 and 1934 when the trade was being transformed by the changes outlined above. This period began with bad harvests at home coinciding with intense competition from imported grain which had a serious effect on miller and farmer alike. The consequence was the rise of a vast trade in imported grain which brought in its train specialised shippers and importers and the establishment of port mills. There were also great changes in farming with increasing emphasis on grass and livestock and the use of imported feeding stuffs. The latter date, 1934, is the best stopping place when there is no intention of dealing with the trade at the present day or its immediate background. By then free trade had ended in a double sense, for not only had the United Kingdom adopted protection but Northern Ireland was also excluded from its Irish Free State market. Joseph Rank Ltd. had expanded into Ireland, North and South, and begun a process of concentration on the manufacturing side which has been continuous. Also, the wholesale reorganisation of the marketing of agricultural produce had begun which provided a framework for the development of the farming industry as it exists to-day.

Some description of the old grain trade of the early nineteenth century will make the dramatic nature of the changes which took place all the more apparent. The commissioners who reported on a railway system for Ireland in 1837-8 made a special study of domestic commerce. They found that grain did not move into Belfast from a much greater distance than thirty miles and that most of it was brought in by farmers in quantities of less than a ton. Randalstown and Lisburn were the chief markets at which dealers purchased supplies for Belfast. Wheat especially, came by sea from East Down but was barely sufficient to satisfy the demand, for the commissioners noted that 'frequently, the demand is so great, that wheat and flour can be bought in London, and resold in Belfast, at a profit.' There was not much milling in Belfast as the available water-power was limited and what there was was needed by the linen bleachers. The main supply then, came from country mills. There was also a sizeable export of corn, meal and flour from the port of Belfast, ranking fourth in value in 1835 and amounting to over 14,000 tons. No doubt, this was mainly oatmeal of which a surplus was available after supplying local needs.⁽¹⁾

A description of the markets for grain in Co. Antrim in 1812 shows a very similar organisation of the trade:

Buyers from Belfast are employed in many parts of the county for the purchase of grain, especially when it can be stored within reach of water-carriage, which is the case with all the district I have mentioned as productive of wheat. These buyers take it off the farmer's hands, and send it, as opportunity offers, by the canal, to their employers in Belfast. The different flour-mills afford very convenient resources to the farmers; indeed, these, and the persons commissioned to buy, are the only methods now in use for the selling of wheat, which is never exposed in the public markets, as it formerly was. Barley is bought for malting by the brewers, who follow both occupations. Little of this grain is now used in the distilleries. . . . For oats, or for the meal that is made of them, there is a ready sale in this populous country, either at the farmer's own door, or in the towns and villages in his neighbourhood. The demand for this grain is likewise great in Belfast, both for its own consumption, and for exportation.⁽²⁾

Belfast had exported 821 tons of wheat in 1810 as against less than 200 tons of oats and 130 tons of oatmeal, but this must be regarded as nothing more than the results of the stimulus to wheat-growing produced by the Napoleonic War.

East Down and the Ards were one of the areas with a climate best suited to grain-growing in the whole of Ireland while the clay soils of south-east Antrim were excellent for wheat. As early as 1683, 'great store of good wheat, bere, oats and barley' were exported from the Lower Ards to Dublin and other places.⁽³⁾ Flour-milling did not come until considerably later. The oldest mill is at Banoge, near Donaghcloney, and still exists although disused for many years. It was built in 1764 in expectation of the trade which would follow the opening of the Lagan Navigation, completed as far as Lisburn in the previous year. This was followed by the building of the Crumlin flour mill in 1765 and the Andrews' mill at Comber in 1771.⁽⁴⁾ At somewhat later dates sizeable flour mills were also built at Lisburn, Dunmurry and Larne. Brewing and distilling were also important industries at Comber, Newtownards, Downpatrick, Hillsborough, Lisburn and Carrickfergus.

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1. *Second Report of the Commissioners appointed to consider and recommend a General System of Railways for Ireland*, H. C. 1837-8 (145), xxxv, 25-6 and 173.
 2. John Dubourdieu, *Statistical Survey of the County of Antrim* (Dublin, 1812), pp. 181-2.
 3. R. M. Young (ed.), *Historical Notices of Old Belfast* (Belfast, 1896), pp. 138-9.
 4. E. R. R. Green, *The Industrial Archaeology of County Down* (Belfast, 1963), p. 36.

While it is true that the needs of a large and rapidly growing population were chiefly responsible for the large area of land under tillage in Ireland before the Famine other factors were of importance. The fact that on Irish farms potatoes were grown for human and animal food and that grain was the cash crop which paid the rent ensured a large acreage. The initial stimulus for wheat-growing was the bounties paid by the old Irish Parliament after 1759, but the long years of international conflict between 1793 and 1815 were a far more important encouragement. The growth of population and industry in the North-West of England created a continuing demand for grain from Ireland, particularly for oatmeal which was an important part of the diet in that area. Indeed, the beginnings of the Liverpool grain trade were almost entirely concerned with imports from Ireland. Exports from ports like Newry and Londonderry of corn, meal and flour were considerable; 25,000 tons and 16,000 tons respectively in 1835.⁽⁵⁾

Much of the trade in Belfast was centred on the markets. Originally, the markets of the town were held in High Street and Cornmarket, but from about 1780 markets began to be held in Smithfield. The cattle market was the first to be established there and then came the pedlars' stalls. A grain market was established about 1804, conducted at a covered shed in the centre of the square, where the corn merchants, brewers and distillers attended to purchase such supplies as might be offered.⁽⁶⁾ The new May's Market was opened in 1813 and meal was sold there as well as potatoes, vegetables, butter and eggs. Grain, straw and hay continued to be sold in Smithfield on three days a week.⁽⁷⁾ Although the area under grain, and particularly wheat, declined rapidly in Ireland as a whole after the Famine, tillage was maintained in the North. In Co. Down, for example, the area under crops attained its maximum as late as 1870. The acreage under oats in the county was maintained at an average of almost 150,000 acres until about 1863, declining nearly fifty per cent. by 1879. Until 1883 an average 25,000 acres of wheat was grown. This is reflected in the grain sales in Belfast markets in 1850 which were supplied to a commission by the clerk of the markets.⁽⁸⁾ Almost 6,000 tons of oats and 2,600 tons of oatmeal and nearly 5,000 tons of wheat were sold.

To complete the trade in grain a mechanism was necessary to take off any surplus over local needs and to supply any deficiency by imports. This was provided by the general merchants of the town for specialisation was slow to develop. The biggest of them were shipowners who exported and imported a wide range of commodities, some tending to specialise in one or another. The records of the Valuation Survey of 1837 describe premises which are often a jumble of grain stores, kilns for drying the grain, pork stores, and timber stores. The grain trade finally acquired its own premises with the opening of the Corn Exchange in 1852 at the corner of Victoria Street and Gordon Street, a building which is still in existence. The membership was made up of merchants who had a special interest in the trade and the millers who looked to Belfast for the sale of their flour and meal. The first chairman, Thomas McClure, was a partner in William McClure and Son, who were general merchants, but with a special interest in grain and tea.⁽⁹⁾

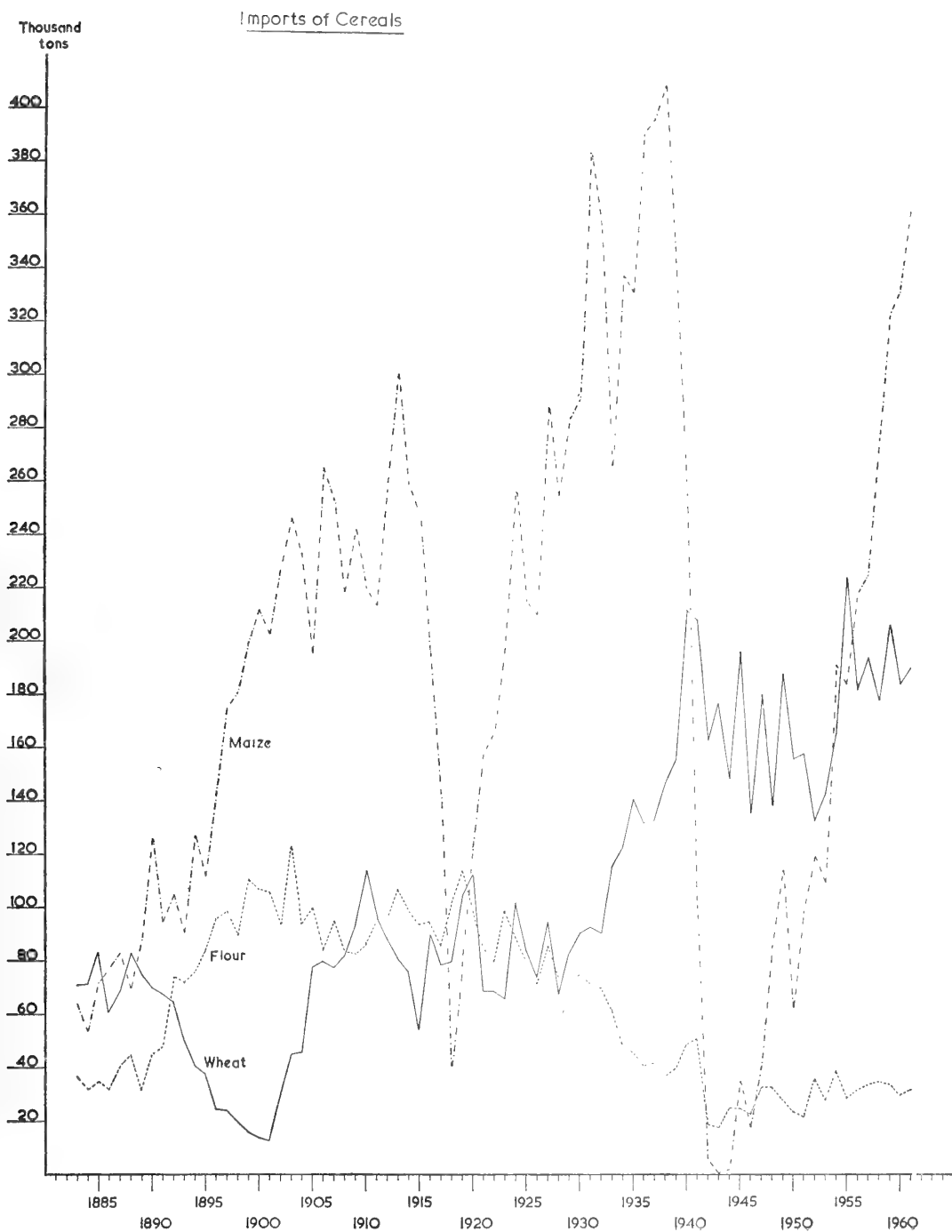
5. *Railway Commissioners, Second Report*, pp. 83-4.

6. George Benn, *A History of the Town of Belfast* (2 vols., Belfast, 1877-80), ii, 113-4.

7. E. R. R. Green, *The Lagan Valley, 1800-50* (London, 1949), p. 142.

8. *Report of the Commissioners appointed to inquire into the State of the Fairs and Markets, Ireland*, H. C. 1854-5 [1910], xix, 409.

9. F. J. Bigger, 'Corn Exchange', in *Belfast News Letter*, 25 Dec., 1924. There is a lengthy obituary of Sir Thomas McClure in *Northern Whig*, 20 Jan., 1893, which is useful on his business career.



Source: Belfast Harbour Commissioners' records.

As has been said, milling was not an important industry in Belfast. The old Manor Mill in Mill Street was undoubtedly the earliest, but it was never a place of much size and changed hands frequently before becoming an engineering works around 1880. The only plant of any size in Belfast was John Alexander & Co.'s mill on the Falls Road which was described as the Belfast Flour Mills as early as 1819 and had been in existence at least ten years before. In 1837 this mill was equipped with a water-wheel of 34 ft. in diameter, driving six pairs of stones, and a new 40 h.p. steam-engine, driving four pairs of stones.⁽¹⁰⁾ There was also the Glenwood Flour Mill on the Shankill Road which belonged to John Cunningham until the 1870s, when it was taken over by Samuel Wilson & Co. The mill, as described in 1837, was a small one with four pairs of stones and adequate water supply for no more than six months in the year. When water was unavailable, a 10 h.p. steam-engine drove one pair.⁽¹¹⁾ In a sense, the earliest of the port mills were the 'steam mills' opened at Ritchie's Dock, now Corporation Square, about 1825 and driven by a 20 h.p. engine. It is likely that this was the earliest steam-engine in a Belfast mill.⁽¹²⁾

Considerable quantities of maize were imported into Ireland to provide emergency rations during the Great Famine and from this derived a most important trade for Belfast and the North of Ireland. Thomas McCammon, who had had a tannery in King Street since at least 1809, built a plant to grind Indian corn in about 1848.⁽¹³⁾ The Belfast directories in the early 1850s list Indian corn millers such as John Cuddy on Queen's Quay, William Hughes in Meadow Street, Neeson in Oldpark, and William Vance on Carrick Hill. There was no dramatic increase in the imports of maize into Belfast though, for another thirty or forty years. Consequently, there was no great expansion of maize grinding.

A steady increase in milling capacity continued as Belfast grew. James Davidson's Bridge Mills date from 1852. Jasper Macaulay & Co. began operating the steam flour mills in Steam Mill Lane off Corporation Square in 1858. Macaulay was no doubt one of the family of the Inver Mills at Larne and it is equally likely that this was the Ritchie's Dock mill. In 1861 the Phoenix Flour Mills began in Great George's Street and in 1868 the Brookfield Flour Mills on the Crumlin Road. About 1870 J. & C. Gardner opened their flour mill in York Lane. Some years later came Harris Bros' Boundary Street flour mills. McCammon's mill in King Street became a flour mill and in 1867 was taken over by the mill and tannery manager, James Neill.

About this time, technical changes of a very fundamental nature took place in milling. The idea of grinding with rollers instead of millstones was first developed in Switzerland as early as 1833 and spread to Hungary a few years later. It was not until 1862 that Buchholz sufficiently improved roller milling to make its superiority unquestionable. The first English roller mill was installed in Liverpool in 1868, but the adoption of the new method was largely due to Henry Simon in Manchester, who by 1881 had devised a system of his own in advance of that used in Hungary. The introduction of roller milling coincided with the coming to Belfast of several important country millers.⁽¹⁴⁾

First came Isaac Andrews & Sons who had been flour millers in Comber since 1771. John Andrews, one of the partners, had been sent for training to the North

10. Public Record Office of Northern Ireland. Valuation Survey Field Books, Val. IB 76A, p. 19 and Val. IB 719A, pp. 99-100. Except where otherwise stated information about the mills is taken from the Belfast directories or supplied by the firms concerned.

11. Val. IB 718, and Val. IB 719A, p. 38.

12. Val. IB 714, p. 1.

13. *Milling*, xxxvii (July-Dec. 1911), 670. The file of this very valuable periodical in the Liverpool Libraries is incomplete, but the best available.

14. The technical history is most easily found in J. Storck and W. D. Teague, *Flour for Man's Bread* (Minneapolis, Minn., 1952)

Shore mills in Liverpool, the first in England to adopt the Hungarian system of roller milling. He eventually became manager and came home reluctantly to manage the family business in 1876. The Meadow Street mills in Belfast were bought in October, 1880, and in 1882 John Alexander & Co.'s mill was purchased. The former had a capacity of 180 tons a week and the latter of 200 tons, far in excess of the 90 tons which the old Comber mill could produce. Both mills were equipped with roller systems. The Comber mill closed in late 1883 and the offices were transferred to Belfast two years later.⁽¹⁵⁾

D. and W. Carmichael, who had been millers at Donaghadee and Millisle since the eighteenth century, built the Dufferin Mills in Duncrue Street in 1881 and fitted them out with a complete roller plant. The Carmichaels only ran the mill for about eight years when it was purchased by W. and S. Mercier of Moyallan, near Portadown. They were the sons of David Mercier, who had been a miller on the River Nore at Durrow until 1860 when he acquired the Moyallan flour mill from Thomas Christy Wakefield. W. T. Mercier had apparently gone to the U.S.A. with D. Carmichael to study the new system shortly before the Dufferin Mills were built.⁽¹⁶⁾

Thomas Henry White opened a warehouse in Belfast in 1885 which by 1892 had developed into the Clarendon flour and meal mills. He was a son of James White who came from Gaul's Mills in Co. Waterford to Tanderagee in 1841. White, Tomkins, Courage & Cracknel was formed as a limited company in 1897 and the business extended to Liverpool and London, the primary concern being flaking for malting.

The decade of the eighties saw the coming of the modern bakery industry. Indeed, it was stated in 1891 that 'there is no manufacture that we know of in the city that has shown such extraordinary advancement during recent years as that connected with the baking trade.'⁽¹⁷⁾ Bernard Hughes was certainly the pioneer, having established an extensive bakery and flour milling enterprise before his death in 1878. His original bakery was started in 1839 in Donegall Street and he subsequently opened two more small bakeries in Donegall Place and on the Falls Road. Finally, production was concentrated on the Springfield Road and at the Model Flour Mills, built in Divis Street in 1877.⁽¹⁸⁾ Most of the other bakeries, for no very obvious reason, were in or around Cromac Street. James and George Inglis opened their bakery in Eliza Street in 1882 and formed a company four years later. John McWatters established his bakery in Cromac Street in 1880. Robert Wilson's Ormeau Bakery was 'newly built' in 1891.⁽¹⁹⁾

The last years of the century though, were disastrous for the Irish flour-millers. The opening up of the North American prairies and the growth of a powerful milling industry in the United States released a flood of imported flour against which it was well-nigh impossible to compete. By 1885 two-thirds of the Irish mills had stopped work. The remainder were living chiefly by the sale of bran which does not stow well on shipboard and had consequently become scarce and dear.⁽²⁰⁾ The struggle for survival was hard. A firm like Isaac Andrews & Sons was nearing the end of its resources in 1895. The Meadow Street Mill was sold to Thomas Gallaher who tore down the building to make way for his new tobacco factory. The Belfast Mills were also closed until the stock had been sold. The partnership of John and Thomas James Andrews was dissolved, the former becoming sole owner. The Andrews mill

15. Sydney Andrews, *Nine Generations* (1958), pp. 155-7, 159 and 161.

16. *Milling*, xxxvii, 670.

17. *The Industries of Ireland* (1891), p. 72.

18. *Milling*, xxxvii, 668.

19. *The Industries of Ireland*, pp. 67, 72, 111, 138 and 144.

20. *Select Committee on Industries (Ireland)*, H. C. 1884-5 (288), ix, 401-2,

thus secured sufficient working capital to go back into business.⁽²¹⁾ Bernard Hughes', on the other hand, closed down their mill in 1900 and sold the machinery. The principal trade periodical regarded this closure as 'a practical capitulation' by the flour-millers.⁽²²⁾

It was at this point that the tide began to turn, the first advantage gained being the invention of an effective bleaching process of John Andrew's son, Sydney. American flour had aged and bleached while in transit and was accordingly far more attractive to the customer than the product of local mills. Sydney Andrews, who had entered the business as recently as 1895 on leaving school, succeeded in bleaching flour successfully with nitrogen peroxide. A patent was taken out in 1902 and successfully defended by the Flour Oxidizing Co. which had been specially formed for the purpose.⁽²³⁾

Isaac Andrews & Sons now made a rapid recovery and constantly expanded and improved the plant. In 1904 F. P. Hughes and Samuel Dickson leased Bernard Hughes' mill. They had previously been in partnership as flour importers, maize millers, and dealers in offals and feeding stuffs. The mill was completely re-equipped on the Simon system. W. & S. Mercier patented a flour bleaching process of their own and in due course emerged from the depression. The Dufferin Mills though, were destroyed by fire in 1911, and the firm then moved across the river to premises on Laganbank Road. James Neill's mill in King Street had a serious fire in 1884, and was then equipped with a roller system by Robinson & Son of Rochdale. Nonetheless, by 1901 the mill was virtually closed. The founder died in 1901, and in October of that year Henry Simon installed a Buhler roller mill.⁽²⁴⁾

Accompanying the great volume of flour imported into Belfast were even vaster quantities of maize and many mills were saved by turning to provender milling. John Andrew's first venture on re-opening the Belfast Mills was to install a small maize grinding plant which was in operation by 1897. Ten years later the mills had a capacity of 400 tons a week as against 900 of wheat.⁽²⁵⁾ Abraham Neill was a pioneer provender miller and ran the Castalia Mills as well as being concerned with the family firm. Castalia was the name of a horse-feed which he manufactured and must be one of the earliest brand names in provender milling in Belfast.⁽²⁶⁾ T. H. White & Co. are supposed to have been the first manufacturers of flaked maize, although it was not immediately used for stock feeding. This was pioneered in England around 1897 by A. R. Tattersall who had been a mill manager for Whites' in Belfast.⁽²⁷⁾ John Thompson was a relative newcomer, first appearing on the Shankill Road in 1884 and then in Beresford Street eight years later in premises called the North End Steam Corn Mills. John Thompson & Sons Ltd. claim that their firm was the first in Ireland to manufacture maize products with roller mills.

In the last years of the century a growing specialisation was seen in the actual handling of grain imported into Belfast. James Gallaher, a younger brother of the founder of the tobacco company, was one of the earliest. R. & H. Hall, a Cork firm, established their first branch at Belfast in 1880 and soon after expanded to Dublin and Waterford. W. & R. Barnett did not really become important until the early years of this century. William and Robert Barnett were the sons of a country miller, near Belfast, who died as a very young man. It was in 1893 that the brothers com-

21. Andrews, op. cit., pp. 163-4.

22. *Milling*, xix (July-Dec. 1902), 66 and xxxvii, 668.

23. Andrews, op. cit., pp. 164-6 and *Milling*, xxi (July-Dec. 1903), 69.

24. *Milling*, xxxvii, 668 and 670.

25. Andrews, op. cit., pp. 164 and 166.

26. *Belfast Evening Telegraph*, 25 Nov. 1910.

27. *Milling*, lxxx (Jan.-June, 1933), 41.

bined to bring a consignment of wheat from New Orleans to Belfast. They were particularly connected with the opening of the Argentine trade, and as shippers set up an organisation and built a silo at Rosario.

Intense competition caused the trade in Ireland to think in terms of protection and of common action for the protection of margins. In 1900 the North of Ireland Corn Millers' Association was formed from twenty-three maize millers to regulate prices and output. Members paid ten shillings a ton into a pool if they exceeded the limit of their output and the same amount if they ground less.⁽²⁸⁾ Two years later the Irish Flour Millers' Association was formed. Interestingly enough, this association was formed on the initiative of the newly-created Department of Agriculture. In 1906 a local organisation, The North of Ireland Grain and Flour Trade Association Ltd., was formed in Belfast.⁽²⁹⁾

The immediate post-war years saw a return of trends already evident before 1914, except that cross-channel competition in the flour trade became even more severe. The Irish Free State sought to solve the problem in 1932 by adopting protection and bringing the milling trade under control. The outlook for Belfast was consequently extremely grave with a large market in the Free State. The flour-millers were faced with the competition of the large new Pacific mill, opened by Joseph Rank Ltd in 1934, who had at the same time moved into the Free State by acquiring James Bannatyne & Sons Ltd. of Limerick and their subsidiaries. In consequence there was some inevitable concentration in Belfast flour-milling, while the provender mills were saved by the dramatic and unforeseen expansion of agriculture in Ulster, particularly in pig production. The import trade changed, too, with the erection of silos to handle grain cargoes at the docks by Rank, Hall, and Barnett who now divided the trade in roughly equal shares. These further developments though, are recent history and would inevitably lead to a description of the trade to-day which is beyond the scope of this paper.

It remains to express thanks to the many individuals who have been so generous with their time in searching for records and in telling what they knew of the history of their families or firms. Special mention must be made of Mr. William Barnett and Mr. Robert Barnett; Mr. W. L. Clements, General Manager and Secretary, Belfast Harbour Office; Mr. T. S. McReynolds, R. & H. Hall Ltd.; Mr. Gordon Neill; Henry Simon Ltd.; Mr. R. E. Thompson and Mr. A. A. White. The graph of imports of cereals for the years 1883-1961 was prepared at the Department of Economics, Queen's University, Belfast, for whose help I am particularly grateful. The import series in the Belfast Harbour Commissioners' *Annual Reports* begins in 1851, but the description of the commodities is not consistent until 1883.

Finally, it should be made clear that this is no more than a exploratory survey of an important aspect of the economic history of Belfast and that much remains to be done. Scattered figures exist from which it should be possible to build up a series of exports and imports before 1883. Useful work could also be done on prices. Inquiry has unfortunately revealed a high mortality of records of firms in the grain trade. Some do exist, particularly those of Isaac Andrews & Sons Ltd., none of which have been used in the preparation of this paper and must have a high priority in any further study.

28. H. W. Macrosty, *The Trust Movement* (1907), pp. 224-5 and *Milling*, xviii (Jan.-June, 1902), 416.

29. *Milling*, xix, 343, 353 and 390 and xxvi (Jan.-June, 1906), 278.

10th December, 1968

THE FLORA OF ULSTER

MISS M. P. H. KERTLAND, M.Sc.

Nine counties make up the Province of Ulster, although to-day the term Ulster is often used to cover only the "Six Counties" comprising Northern Ireland. In the *Cybele Hibernica*, an Irish Flora published in 1868 by More and Moore, the 32 counties of Ireland were grouped into 12 botanical regions numbered from SW (1) to NE (12). The three we are concerned with are:—

(12) Antrim, Down and Londonderry (east of the R. Foyle).

(11) Donegal and Londonderry (west of the R. Foyle).

(10) Armagh, Fermanagh and Tyrone; with the now separated counties of Cavan and Monaghan.

Group (12) being the north-eastern maritime counties, (11) the north-western Maritime area and (10) an inland river basin and lakeland district.

There are three different interpretations of the term "flora":—

(A) flora—the actual plants growing in an area.

(B) Flora—a book describing plants and how to identify them. This usually has keys and illustrations, e.g., many British *Floras*.

(C) Flora—a book giving the *distribution* of plants within a region—usually a "County Flora"; often supplied with maps and details of habitats and locations.

It is the third of these (C) that we are dealing with here.

The first published *Floras* of Ulster counties were by Tate (1863), Dickie (1864) and Stewart and Corry (1888), in fairly rapid succession. Long before this John Templeton (working practically alone, *circa* 1790-1820) had compiled the manuscript of "A Catalogue of the Native Plants of Ireland" and had amassed records for a "Hibernian Flora". These manuscripts and his Herbarium covered all the groups of the Plant Kingdom. These manuscripts, the results of 30 years work, were never published and Templeton's extensive biological collection was scattered after his death in 1825. Some account of this is given in *A Flora of the North-East of Ireland* (Second Edition) and recent notes in *The Irish Naturalist's Journal* (15: 229, 226, 318).

To return to the published County *Floras*, Ralph Tate's *Flora Belfastiensis* appeared in 1863; to be followed the next year by George Dickie's *Ulster Flora*. In this *Flora*, Dickie added records from district (9) the north Connaught counties of Sligo, East Mayo and Leitrim, thus increasing greater Ulster by three counties.

In 1888, *A Flora of the North-East of Ireland* was published by Stewart and Corry. This covered the counties of region (12), Antrim, Down and Londonderry (east of the R. Foyle). Stewart who was the main author had been working with Tate and continued the survey with the help of T. H. Corry and other members of the Belfast Naturalists' Field Club. Corry, unfortunately was drowned before the work was completed. If Templeton's manuscripts had been published they would have predated this *North-East Flora* by about 70 years. As it was the "Catalogue" was available to both Dickie and Stewart and many of Templeton's records are included in their *Floras*.

In 1893, Praeger, working for three weeks (!), in County Armagh produced a "Flora" of that county in a series of papers printed in volume 2 of *The Irish Naturalist*, and in 1898, Hart produced *A Flora of the County Donegal*. This was the heyday of

Field Club activity and in 1894 and 1923 *Supplements* to the *N-E Flora* were produced. In the same period an active Field Club centered in the Cookstown-Dungannon area of Co. Tyrone was collecting material for a "Flora" of that county. When the last of the original compilers died, shortly after the second World War, their manuscript was passed on to me, this has since been typed and the Herbarium specimens, which were given to the Armagh County Museum are now in the care of the Ulster Museum in Belfast.

In 1938 the Belfast Field Club celebrated the 50th Anniversary of the publication of *A Flora of the North-East of Ireland* by publishing a completely revised *Second Edition* and the subsequent records have been kept up-to-date, as far as flowering plants are concerned, by E. N. Carrothers, who publishes additional Lists from time to time in *The Irish Naturalists' Journal*.

What of the sixth county of Northern Ireland, County Fermanagh? Almost twenty years ago three members of the Belfast Naturalists' Field Club together with Mr. Meikle of Kew commenced a "Flora" of this county. According to one of the authors this is still "unfinished", but the result of their work is now in typescript. Copies of the typescripts of this "Flora" and that of County Tyrone are stored in the Science Library of the Queen's University of Belfast and are available "for consultation only"—at the discretion of the Librarian.

Since 1955, members of the botanical section of the Belfast Naturalists' Field Club, in conjunction with the Armagh Field Society, have been revising Praeger's "Flora of County Armagh", and in 1968 a "Preliminary Report" of progress on the "Flora" was published. This now means that the floras of 7 of the 9 counties of the original Province of Ulster have been recorded. In the other two counties, Cavan and Monaghan a certain amount of work has been carried on in connection with the Mapping Scheme of the Botanical Society of the British Isles, so it can now be said that a start has been made towards "Floras" for both counties.

* * * *

Since the 1880s the whole aspect of our Ulster countryside has changed. New farming methods decrease the number and variety of flowering weeds. Others are introduced from imported material and garden dumps. Poppies (*Papaver* spp.) cornflower (*Centaurea cyanus*) corn-cockle (*Agrostemma githago*) and chicory (*Cichorium intybus*) all of which were common plants in the 19th Century are now considered great rarities. Balsam (*Impatiens glandulifera*), fireweed (*Chamaenerion angustifolium*) and the little creeping willow-herb (*Epilobium nerterioides*), earlier noted as "rare" in the wild state are now widespread. Hedges are ripped out to make larger fields and room for tractors to manoeuvre and to widen roads for motorways; those that are left are kept closely clipped and marginal strips treated with weedkiller. The wild roses that once lined the road to Belfast airport are now gone.

In our urban society plants rarely get the chance to grow naturally, but in the centre of Belfast, in the shipyards, there was, until 1965, a uniquely protected site, where it was possible to record a list of over 80 wild plants including a shrubbery of willows (*Salix* spp.) and where 90 birds, many of them resident, were listed (*Irish Naturalists' Journal*, 15: 258-266). This whole area is now a mass of concrete forming the new dry dock.

There is ample archaeological and historical evidence to show that Ulster was originally well wooded. It is now one of the most thinly forested regions in Europe. The present day acreage is mainly the remains of demesne plantations of the 18th and 19th centuries and these estates are almost confined to the western counties—Tyrone, Fermanagh and west Armagh. The 20th century government plantations are mainly of conifers and not a comparable replacement of the original community. The native

woodland was typically deciduous, mostly oak (*Quercus* spp.), ash (*Fraxinus excelsior*) and hazel (*Corylus avellana*) with a well developed ground flora. What corresponds to the remains of the original native woodland may be seen on some of the sheltered scarps of the Antrim hills in the form of oak-hazel scrub. Elsewhere what has survived is a profusion of ferns and mosses, as the ground flora may persist even where woodlands have been felled and many species such as wood-sorrel (*Oxalis acetosella*) and wood-anemone (*Anemone nemorosa*) find refuge in the hedgerows.

In Ireland there are more roads and lanes per acre than in any comparable area of the British Isles, and we may take it that there are no truly undisturbed areas in Ulster. Some are less interfered with than others—lakes, marshes, bogs, sea-shore and mountains—but even these are vulnerable.

Five of the Ulster counties surround Lough Neagh, the largest lake in the British Isles. The lake area has been reduced by hundreds of acres by the several lowerings of the water-level—the last only a few years ago. This is economically essential to prevent flooding of agricultural land and provide a scouring current for the Lower Bann, but it is inimical to the interesting native flora. Rare water plants such as *Pilularia*, *Subularia* and *Zannichellia* grow in these basic waters and the surrounding fenlands carry a richer flora than that of the Cambridgeshire fens—the ladies-tresses orchid (*Spiranthes romanzoffiana*), frogbit (*Hydrochaeris morsus-ranae*), marsh vetchling (*Lathyrus pratensis*) and holy grass (*Hierochloa odorata*) to name the most interesting; but many of these are hard to find now.

The smaller lakeland waters usually suffer from silting-up and dumping. Where drainage is maintained this may become marshland or where drainage is impeded and the water becomes acid it will be converted into bog as in the many inter-drumlin lakes in County Down. The Irish climate is conducive to peat-formation and a blanket of peat covers our uplands. The Antrim Plateau is the only station in Ireland for the two rare sedges, *Carex magellanica* and *C. pauciflora* and the only station in Ulster for the yellow bog saxifrage (*Saxifraga hirculus*). Other interesting plants recorded and also recently seen are:—

Little bog orchid, *Hammarabya paludosa*; Traunstein's orchid, *Dactylorchis traunsteineri*; Pale butterwort, *Pinguicula lusitanica*; Cranberry, *Vaccinium oxycoccus* and the parsley-, oak- and lesser filmy-fern (*Cryptogramma crispa*, *Dryopteris phegopteris* and *Hymenophyllum wilsoni*). Two rare bog mosses, *Sphagnum strictum* and *S. molle* have also been found there. Two old records which have not been seen recently are *Pyrola media* and *Isoetes locustris*. These may yet be refound; they are present in one or two of the other Ulster counties. The most interesting part of the Plateau botanically is now (1968) being bull-dozed to create a new reservoir.

Ireland is the flattest country for its size in the world and Ulster has no mountains—if the geographers criterion "a land mass over 3,000 feet" is used. Nevertheless typical mountain plants constitute an integral part of the Ulster flora and many are found even at sea level. On the basalt scarps of Benevenagh at about 1,000 feet *Dryas octopetala*, *Silene acaulis*, *Minuartia verna* and *Salix herbacea* are well established and two alpine *Lycopodiums* are also found. On slightly lower levels of the Antrim cliffs *Galium pumilum*, *G. boreale*, *Saxifraga aizoides* (the lesser yellow saxifrage) and *Rubus saxatilis* (the stone bramble) are found. The much rarer *Rubus chamaemorus* (cloudberry) has only one station in Ireland in the Sperrin mountains of County Tyrone, and even there it has not been seen to flower recently. The Mourne Mountains in County Down are floristically uninteresting but *Isoetes* flourishes in Bignian Lake and one of the cliffs of the inner range bears *Saussurea alpina* (saw-wort), which has only one other Ulster station on Muckish, County Donegal.

The most attractive and abundant plant on the Mournes is *Ulex gallii*, the western or autumn flowering whin, forming a carpet of gold and purple with the heather in

the late summer and autumn. This plant, which is at its best in the west of Ireland, only occurs in a limited area of Ulster. Beyond south Down and Armagh it grows on Rathlin Island, off the north coast of County Antrim. There are old unconfirmed records of its occurrence, in the Cloughmills area of County Antrim and in southeast Londonderry, which should be checked.

Ulster has a long coast line and here we find those specialised plants which can bear the extremes of salt-laden winds and extreme dessication. Cliff plants such as roseroot (*Sedum rhodiola*) and samphire (*Crithmum maritimum*), still abundant in County Donegal are represented by isolated plants in County Antrim. The oyster plant (*Mertensia maritima*) is found on shingle beaches in Down, Antrim and Donegal, but the yellow horned poppy (*Glaucium flavum*) is confined to the south Down coast in our area.

Sand-dune areas are more floriferous with sea-holly (*Eryngium maritimum*), sea-convolvulus (*Calystegia soldanella*) becoming increasingly rare; but sea-milkwort (*Glaux maritima*) and the sea-spurreys (*Spergularia* spp.) are still abundant. Other plants which have a mainly coastal distribution are the sea-pink (*Armeria maritima*), the burnet rose (*Rosa spinosissima*) and thyme (*Thymus drucei*). Thyme is common in Antrim, Down and Londonderry but is absent from the counties of Armagh, Tyrone and Fermanagh.

Other plants have an intriguing distribution pattern. The Killarney fern (*Trichomanes radicata*), once probably growing in every county of Ireland has now only two known stations in Ulster. Cowslips, which run wild in the adjacent Province of Leinster are rare in Ulster; in the counties of Armagh and Antrim where they do occur they are classed as introductions. Among orchids flower production is erratic and the several species are probably under-recorded, as are also many of the very early spring flowers such as the goldilocks buttercup (*Ranunculus auricomus*) and the early violet (*Viola reichenbachiana*), with flowering periods from February onwards, before most field excursions are planned. We have a very limited knowledge of the distribution of the underwater plants of Ulster such as *Elatine*, *Subularia*, *Pilularia*, and even of the commoner pondweeds (*Potamogetons*), which have not been dredged for systematically since the early part of the century. There is much interest still in hunting for new records.

* * * *

In conclusion I would draw attention to two important dates in relation to the Ulster Flora—1888 and 1988: the latter lies only 20 years ahead. Would it not be a fitting recognition of the Centenary of the publication of the first edition of *A Flora of the North-East of Ireland* to start now to prepare a complete set of Floras for the Six Counties of Ulster to be published in 1988?

11th March, 1969

QUAKER FAMILIES

J. R. H. GREEVES, T.D., J.P., B.Sc., M.I.E.E.

The Plantation of Ulster brought many English and Scottish settlers to the North of Ireland, and although the Rebellion of 1641 forced many of them to flee back across the water, they and others commenced to return very soon afterwards. In addition, many of Oliver Cromwell's soldiers received land as compensation for arrears of pay; others left the army and settled in the new country, and among these was a young man named John Edmundson. While he was still a serving soldier, he persuaded his brother William to come over also. William was born at Little Musgrave, Westmorland in 1627, the son of John and Grace Edmundson, and after serving his apprenticeship as a carpenter and joiner, joined Cromwell's army, in which he saw service in Scotland and England, being present at the Battle of Worcester in 1651. He left the army in the next year and got married; and in the same year came with his wife over to Ireland, having provided himself with goods for sale, and settled, as a shopkeeper, at Antrim, near where his brother was stationed. The following year he went over to England to buy goods and while there came under the influence of James Naylor, a companion of George Fox, the founder of "The Society of the Friends of Truth" (commonly called Quakers) and accepted their principles.⁽¹⁾

George Fox was born at Drayton-in-the-Clay (now called Fenny Drayton) in Leicestershire in July, 1624, the son of Christopher and Mary Fox. From the age of 20 years he was much disturbed spiritually, visiting many clergymen and others in search of Truth as he conceived it. Like Omar Khayyam he "did eagerly frequent Doctor and Saint, and heard great argument about it and about, but evermore came out by that same door wherein he went." In 1649 he began preaching up and down England, basing his interpretation of the Bible on what "The Inner Light" (i.e., The Holy Spirit dwelling in him) shewed him.⁽²⁾ Thus was Quakerism started and, in due course, it was brought to Ireland by William Edmundson who, after his "convincement" by the preaching of James Naylor, returned to Ireland, where he became the Apostle of Quakerism in that country. In 1654 he removed from Antrim to Lurgan where, soon afterwards his brother joined him; and the first Quaker Meeting in Ireland was started in his house;⁽³⁾ from this as headquarters he travelled all over Ireland preaching the new doctrines.

Among those who were early members of Lurgan Meeting were two brothers, Richard and Anthony Jackson, who had come from Lancashire in 1649, Richard being at that time in the Parliamentary army. Later they went with William Edmundson and settled in County Cavan and later still moved farther south to Mountmellick and elsewhere. Both of these are numbered among my ancestors, Anthony being my great great great great great great grandfather and Richard, by another line of descent, my great great great great great great grandfather. I shall have something to say about the Jackson family later on.

In 1657 Robert Turner, a Friend from Northumberland, was "instrumental to the convincement of a few who lived at Grange near Charlemount . . . their numbers

(1) Journal of William Edmundson; Dublin 1715; pps. 1 ff.

(2) Journal of George Fox; London 1709; pps. 1 ff.

(3) Journal of William Edmundson; Dublin 1715; pps. 12, 13: History of the Rise and Progress of the people called Quakers in Ireland; Thomas Wight, enlarged and continued by John Rutt; Dublin 1751; pg. 78.

being considerably increased through the labours of other travelling Friends, a Meeting was settled there in 1660."⁽⁴⁾ This Meeting, like that at Lurgan, still flourishes. Among the earliest families connected with Grange Meeting were those of Greer or Greeves and Whitsitt or Whiteside, many of whose descendants played a prominent part in the life of the Meeting over three centuries; the Greeves family is still represented in the list of Members.

George Fox had taught that it was wrong to pay the Church dues known as Tithes, which went to form the stipend of what he called "an hireling Ministry," or otherwise to support the "Established Church so-called." Goods, livestock, etc., were therefore forcibly taken by the Tithe-Collectors, often to a value considerably greater than the amount of the tithe. William Stockdale, an early member of Grange Meeting, has preserved for us a great amount of information on the subject in his book "The Great Cry of Oppression" (1683).

Here are some examples of 'Sufferings' recorded by Stockdale. "1671 Co. of Tyrone—Henry Greer had taken from him for tithe by the said Edward Conrey (the tithe collector) three loads of hey, and fifteen stooks of oats, worth 6 shillings and 6 pence";⁽⁵⁾ "1672—Henry Greer had taken four cartloads of hey, three stooks of wheat, three stooks of rye, 28 stooks of barley and 24 stooks of oats all worth one pound seven shillings and four pence"⁽⁶⁾ 1673—Henry Greer had taken by the said Edward and William Dickson, one stook of wheat, 3 stooks of rye, 17 stooks of oats, 15 stooks of barley and cut one yard of hey out of his stack being but 8 yards—in all worth one pound. Afterwards the said Edward forceably entered the said Henry's stableyard, threw down a stack and took away what corn he pleased; a son of Henry's taking one of their horses by the bridle said he could find in his heart to take him to the Pound, the said Edward came behind him and knocked him down with his sword in the sheath, and the same day afterwards took out of his barn what corn he pleased."⁽⁷⁾ "1678—Mary Greer (widow of Henry) had taken by John Speer and Daniel O'Lallen 5 stooks and one half of oats, 12 stooks of barley and 3 stooks of wheat all worth 6 shillings and ten pence."⁽⁸⁾

Careful records were also kept by the Meetings of all such "Sufferings" of Friends, and these were entered in The Great Book of Sufferings which is kept in Friends' House, Eustace Street, Dublin. The following extract shews how exorbitant some of the demands were:—"1670—Thomas Sawyer for not paying 7 pence to the repair of the seats and windows of the parish worship house of Benburb, had taken from him a pewter dish worth 2 shillings, also William Stockdale for 2 pence had a pair of potthooks worth 4 pence; Thomas Baker for 8 pence had taken a pan worth one shilling; John Whitsitt for 7 pence a bridle; Thomas Francis for 2 shillings lost a mare worth 10 shillings. . . ."⁽⁹⁾

It will be noted from the above extracts that farming was a principal occupation of these early Friends. To this were often added spinning and weaving, tanning and in some cases shopkeeping; later bleaching of linen was largely undertaken. Certain Friends also acted as bankers, lending money to their neighbours at reasonable interest. But times were not easy—in the wars of 1689-90 many had their goods and houses destroyed. John Whiteside (or Whitsitt) and his family "wonderfully escaped the

(4) Wight & Ruty; loc. cit. pg. 119.

(5) The Great Cry of Oppression; William Stockdale; 1683; pg. 6.

(6) W. Stockdale loc. cit. pg. 18.

(7) W. Stockdale loc. cit. pg. 30.

(8) W. Stockdale loc. cit. pg. 103.

(9) Quoted in "Historical Sketch of Grange Meeting"; George Chapman; Dungannon 1960, pg. 6.

hands of cruelty with their lives, being in immanent danger often by the Rapparees and dwelling between two garrisons, one english and the other irish who had hot disputes, killing each other at his very house," and Thomas Greer, a son of Henry, "lost his life by a shot into his mother's house in the night by a parcel of Rapparees coming to rob the house."⁽¹⁰⁾

From the earliest days of Quakerism Friends were enjoined to keep accurate registers of births, marriages and deaths, and minutes of all meetings other than those merely for worship. In early days copies of the wills made by Friends were carefully entered in books provided for the purpose; marriage certificates were in evidence at weddings and these were normally signed by all those present, the relatives being allotted special columns. These certificates were generally copied into a marriage book, thus providing not only a register of marriages, but much valuable material for the genealogist. A central register of marriages for all Ireland was kept in Dublin and this is most useful where, as has unfortunately happened in some cases, the local registers have disappeared. The Record Clerks also kept "Family Records," in which are entered the names and dates of birth (and death if they died young or unmarried) of the children in each family, the parents' names being entered at the top of the page, and page references being given to where the children's marriages may be found; this has resulted in the preservation of a continued genealogical record of whole families.

Another source is the series of Testimony Books, in which testimonies to the saintly lives of prominent deceased members were written by instruction of the meeting; on the other hand careful note was made of testimonies against those who transgressed the rules of the Society and were admonished or disowned. Let me give you a few examples; first a testimony from the Meeting as to my great great great great grandmother Mary Greer (or Grives)), daughter of John Whitsitt:—"She was of a sweet temper and laboured much in her own family in Gospel love that her children and servants might be preserved out of pride and idleness, and live in the fear of the Lord. She was a loving wife, a good neighbour being much given to hospitality, and her heart and house were open to entertain Friends. She departed this life 9th of 10th month 1742 in the 73rd year of her age, a Minister about 34 years."⁽¹¹⁾

Now the other side of the picture. One of the strictest of Quaker rules was that members must not marry "out" of the Society; those who did so were disowned. "21st 3mo 1707—James Greer having with sorrow given acct yt his daughter Mary Greer hath lately and secretly gone away with a man and married with a priest. . . ." Mary is disowned.⁽¹²⁾ Even marriage between Friends was only accomplished after a long and tedious procedure. Both the young people had to have the consent of their parents; they then had to lay their proposal before their own local meetings, giving at least 6 months' notice of the intended date; after this they were each visited by two or three duly appointed persons whose duty was to ascertain that there were no previous entanglements or promises of marriage or other impediments such as loose living. If the young people were members of different monthly meetings, these "committees" corresponded with their opposite numbers to make certain that no impediment existed, and then had to report back to the monthly meeting. If all was well, final consent of the Provincial Meeting had to be obtained, after which their "intentions of marriage" were published at two meetings for worship where the man and woman lived. The date of the wedding could then be fixed. Is it any wonder that young people, impatient of this long drawn-out preamble, often took the bit between their

(10) Wight & Rutty loc. cit. pps. 159, 160.

(11) Quoted in letter from Frederick Greer to Malcom Smyth dated 21 Oct. 1898.

(12) Minutes of Lurgan Meeting, 1675-1710.

teeth and went to the Parish church to be married by the Rector. This was known as "marriage with a priest" and was automatically followed by expulsion from the Society.⁽¹³⁾

I regret to have to tell you that my great great great great grandfather John Greer took this disgraceful step. Here is the Minute of Disownment—"there is one John Greer and Mary Whitsitt have let out their eflections to one another in relation to maradge unknowne to both their parents and when it was knowne to their parents they did often advize and counsell them to the contrary but they would not take their parents counsell but did follow their owne ways contrary to the prensables they made profishtian of, soo went too a preest and was maryed which hath been noo small grefe to their honest parents for which actions afore mentioned the sd John Greer and Mary Whitsitt have disunited themselves for being of our sooseyetty and goe out of unitty and fellowship with us whoo are called Quakers untill an unfained repentance works a true reformation in them which is the earnest desire of us to the Lord on their behalves. . . ." This is dated 3rd 8mo (Oct.) 1716 and is signed (inter alia) by Robert Greer, John's father, William Whitsitt the elder, John's uncle, and William Whitsitt the younger, Mary's father. It is pleasant to find on the next page of the book "A testimony given by John Greer and Mary his wife against themselves" in which they acknowledge their transgression.⁽¹⁴⁾ The minute receiving them back into membership is wanting, but John became a prominent and useful member of the meeting. The reason for the parents' opposition in this case was that John and Mary were cousins, and such marriages were discouraged, although in such a closely knit group of people it became increasingly difficult to prevent them. As an instance of the persistence of this dislike of marriage between cousins, my great grandfather Thomas Greeves gave up all thoughts of marrying Mary McMeakin, with whom he was in love, because she was his 1st cousin once removed.

As mentioned above, one of the earliest members of the Meeting at Grange was Henry Greer. It is a curious fact that members of the Greer family were known from time to time as Greve or Greeves; the family finally divided into two distinct branches calling themselves Greer and Greeves. The ambiguity persisted, however, well into the 19th century.⁽¹⁵⁾ Henry, who was the son of James and Mary Greer of Rock, near Alnwick, Northumberland, came to Ireland with his wife Mary, daughter of Robert and Deborah Turner of Turnerstead, Northumberland in 1653. He got a lease of parts of the townlands of Bernagh and Altnavannog from the Knox family and settled at a spot overlooking the Red Ford on the River Rhone between Dungannon and Moy; there were three sons, James, Robert and Thomas, and their descendants multiplied and spread, marrying into other Quaker families:—Reas, Turners, Whitsitts, Mortons, Pillars, Kings, Hobsons, Shaws, Sintons, Malcomsons, Kirks, etc., etc. From Henry and Mary Greer are descended such diverse people as the late Sir Harry Greer, Steward of the Irish Jockey Club, Manager of the National Stud at the Curragh and Senator of the Irish Republic; William Derrick Lindsay Greer, the present Bishop of Manchester; the late F.M. Sir John Dill, sometime C.I.G.S.; Alec H. C. Greer, lately Mayor of Lurgan, and Benjamin Greer, Innkeeper in Omagh and Derry round 1847.

Robert, second son of Henry and Mary Greer, married Mary, daughter of John Whitsitt of Grange in 1691. They had four sons and five daughters: Sarah, one of the daughters, never married, but from the others are descended families of Shaw, Pillar,

(13) Wight & Rutty; loc. cit. pps. 464-469.

(14) Testimony Book No. 1, Grange Meeting; nos. 20, 21.

(15) For example; in 2 leases from Lord Charlemont to William Greeves dated 16 and 17 Nov. 1750, the lives in one are Jonathon Greeves and his two sons, and in the other Jonathon Greer and his two sons.

King, Hobson, etc. The youngest daughter, Susanna, married Thomas Toppin of Crucatt, Kilmore, Co. Armagh—their daughter Mary married Abraham Bell of Lurgan, great great grandson of Archibald Bell of Arkinholm, Dumfriesshire, whose son, also named Archibald, came to Ireland in 1655; Abraham's daughter Ann married Thomas Malcomson of Lurgan and was mother of Rachel, wife of Thomas Greeves, my great grandfather. Another Toppin daughter, Susanna, married Joseph Murphy of Rathfriland, and was grandmother of Joseph John Murphy, a prominent member of this Society—Hon. Treasurer 1860-67; Pres. 1866-68 and 1871-74; Pres. of the Linenhall Library 1874-94. His brother Isaac James was also a shareholder, and two of his granddaughters, Mrs. Caroline Kennedy of Derry and Mrs. Emma Crawford, of Island-Derry House, Dromore, Co. Down, are still shareholders.

Archibald Bell was the forefather of another very large Quaker connection; among his descendants were Abraham Bell, Banker of New York, my great great grandmother's brother; George Montserrat Walker, J.P., Chairman of George Walker & Co. Ltd., Newtownards; Messrs. G. P. and R. H. Bell, well-known architects in Belfast; Mrs. Lesley Lindsay, wife of Christopher Lindsay of Mallory, Killyleagh, and Bells well-nigh innumerable in America, New Zealand and at home.

The Malcomson family, descended from Andrew Malcomson who came from Scotland in the latter half of the 17th century and married a girl named Jane Tugh from near Lurgan, have also spread far and wide. Among descendants were David Malcomson, of Clonmel, whose sons and grandsons were millers, brewers, shipbuilders and shipowners in a very large way in the Suir valley in the 19th century; Herbert J. Malcomson of the well-known stockbroking firm Joseph Malcomson & Co., Arthur Street, and many Malcomsons about Lurgan, etc. Other prominent descendants were the late Sir Joseph Barcroft, F.R.S., Professor of Physiology at Cambridge, and his son Henry, F.R.S., Professor of Physiology at Q.U.B., 1935-48, and now at St. Thomas' Hospital, London.

To return to the family of Robert and Mary Greer, their son John (the one who married "with a priest") succeeded, on his father's death in 1730, to a considerable portion of the townland of Grange which had belonged to his grandfather John Whitsitt and was known as "Whitsitt's Farm." This is still in possession of the family; his great great great great great grandson Eric Greeves owns it and lives there. The house, which is just opposite the Friends' Meeting House at Grange, was rebuilt in 1835, and thoroughly put in repair and decorated by Eric's father and mother after his grandfather's death in 1950.

The Whitsitts were an extensive family whose connection with Friends lasted for several generations. William Whytside of Grange, who was probably John's father, is mentioned in the Hearth Money Rolls of 1666. John Whitsitt married Alice, daughter of William Brownlow of Ballywooley, Kilmore, a cousin of Sir William Brownlow, ancestor (through the female line) of Lord Lurgan. The Brownlows, like the Whitsitts, only remained Friends for about three generations, but among William Brownlow's descendants are the Nicholson family of Cranagill, Co. Armagh, and the celebrated Brig.-Gen. John Nicholson, of Delhi fame. Some of the Whitsitts migrated to Co. Monaghan in the early 18th century, and the name is still to be found there.

John Greer's son William apparently decided to stick to the alternative form of the name Greeves, for he married "under the names of Greeves which name he assumed" Mary, daughter of James Morton⁽¹⁶⁾ who was his 1st cousin once removed, her mother having been Sarah Whitsitt, niece of John's wife Mary. They had 13 children, and among their descendants, apart from my own immediate family, are

(16) Family Records Book, Grange Meeting.

Frederick Douglas (Eric) Greeves, of Grange, the senior male representative of the family; John Ernest Greeves, C.B., Permanent Secretary to the Ministry of Home Affairs; and several families in New Orleans, U.S.A., who descend from a cousin of my great grandfather, John Greer Greeves, who emigrated to America in the early 19th century, married a French girl, Marie Forstelle, and had 10 children, of whom a daughter Diane married Paul le Blanc and has many descendants in New Orleans; her brother Augustin had many grandchildren, but only one remains in New Orleans, Miss Bella Greeves. Elizabeth Jane the youngest daughter of John Greer and Marie Greeves, married Robert Anderson from Armagh (whose brother Samuel was Rector of Upper Falls Parish) and was mother of Edith, wife of a well known dentist in Kilkeel, T. Leslie Massey.

William, who was a prominent member of Grange Meeting, being actively concerned in the building of the "new meeting house" (which is now "the old Meeting House") in 1756, died in 1776 and among the articles disposed of in his will are three silver cups which are now in the possession of his great great great grandson Thomas J. Greeves, of Bangor. His wife Mary outlived him by 38 years, having moved to a house in Donidead Townland which she called "Hawthorn Lodge" (now demolished). "She spent much time in helping her poorer neighbours, and was much beloved, having great skill in compounding medicines and suchlike; she was known as "the big Madam."⁽¹⁷⁾ Her family, the Mortons, have since lost all connection with Friends. Two brothers, John and Samuel Morton, came from the parish of Kilmore, Co. Armagh, and settled in Moyallon. Samuel was Mary's grandfather, and John was father of Margaret who in 1733 married James Christy of Moyallon, of whom more later. Mary's brother John Morton, emigrated to U.S.A. and became a prominent citizen of Philadelphia, though he was not the John Morton who signed the Declaration of American Independence.

John, 10th child of William and Mary Greeves, born 1761, was by turns farmer, bleacher, and shopkeeper in Dungannon and later in Lisburn, where he died. He married in 1789, Margaret, daughter of Thomas Sinton of Moyallon by his wife Margaret, daughter of James Christy and Margaret mentioned above. The Christys were a very extensive family, descended from Alexander Christy of Aberdeen, born 1642, who came over to Ireland and settled at Moyallon. His son John, also of Moyallon, had five sons, from one of whom, John, are descended the Christys of Watergate, Surrey, the Christie-Millers of Kircassock, Co. Down, and the founder of Christys, the famous hatters, of London. James, another son, married Margaret Morton as before mentioned, while Thomas founded a very extensive linen business at Moyallon and left it, on his death in 1780, to his grandson Thomas Christy Wakefield, son of Hannah Christy and Joseph Wakefield, an English Friend, descended from Roger Wakefield of Westmorland, whose wife was a lifelong friend of George Fox's wife Margaret. Thomas Christy Wakefield married Jane Goff of Horetown, Co Wexford, and was grandfather of Jane Marion, second wife of John Grubb Richardson of Moyallon, one of the partners in Richardson Sons, & Owden, of Bessbrook, Glenmore and Belfast; their grandson, John S. W. Richardson, is the present chairman of that company.

Thomas Christy Wakefield's sister Isabella married John Nicholson of Dublin and of Stramore Lodge, Gilford, and was grandmother of General John Nicholson already mentioned. The ramifications of the Richardson and Nicholson families are too vast to go into here, but among other descendants of John Christy of Moyallon were the Dawsons who were for a time at Elmfield, Gilford, and Major William S Brownlow, of Ballywhite, Portaferry.

(17) MS History of the Greer and Greeves Families; J. R. H. Greeves; Chapter XIV.

Thomas Sinton, who married Margaret Christy, was son of Jacob Sinton who, with his brothers Joseph and Benjamin, came to Ireland with their widowed mother Elinor at the end of the 17th century. One tradition has it that the name was originally Swinton and that Elinor was widow of Isaac, son of the Quaker John Swinton of Swinton, whose family, of Saxon origin, is one of the few tracing an unbroken descent from the time of the Conquest. Among the descendants of Jacob and Benjamin Sinton are many of the name here and in America, several of whom served with distinction in the late war; including the late Brigadier J. A. Sinton V.C.; Mrs. Tom Ferguson of Banbridge and Mrs. Herbert Bryson of Huntly, Dunmurry.

To return once again to my own people:—Before my great great grandfather John Greeves' marriage to Margaret Sinton, he got a lease of part of the lands of Bernagh near Dungannon and built thereon a small house in which his family were brought up. This house, now called Fernshaw, was added to about 1848 by his son Thomas and was the family home until 1871 when, on the death of my great grandmother, it was sold. John and Margaret Greeves had 10 children; the eldest daughter, Mary, married Daniel O'Brien of Carlow; her descendants include Sir Lucius O'Brien, sometime Chairman of the N.I. Housing Trust, and H. Trevor Eves, inventor of the Eves push-bar drawing frame, which revolutionised the preparing of tow yarns. Ann, the second daughter, married Daniel O'Brien's brother William and emigrated in 1818 to America, where she had numerous descendants, her sons found it advisable to change their name, as they were thought to be R.C.'s and shunned by neighbours in consequence, so they took their grandmother's name of Sinton. Jane the youngest daughter, married John Owden, partner in the firm of Richardson Sons & Owden, and was ancestress of, among others, Commander R. Graham Lowry, High Sheriff of Co. Down this year; the late Mrs. MacNeice, wife of the well-known Bishop of Down, Connor and Dromore; and Dorinda, Lady Dunleath.

About the turn of the century occurred an unfortunate split in the ranks of the Friends and many resigned their membership or were disowned. Among these were John and Margaret Greeves. They continued to attend meeting, however, and their eldest son Thomas was a prominent member of Grange Meeting, an Elder and a very strict Friend. He had quite a prosperous wholesale and retail draper's business in Perry Street, Dungannon, to which he added dealing in such unexpected things as iron ore. He made periodical trips to England to buy goods, but his health was poor and he had to retire in 1848, dying in 1852 at the early age of 60. His widow Rachel, daughter of Thomas Malcomson of Lurgan, survived until 1871. Among their children were my grandfather John and great uncle Thomas Malcomson Greeves; these both served their time with Messrs. Richardson Sons & Owden, John eventually becoming Manager of Bessbrook Spinning Mill and T.M. Manager of Glenmore Bleach Works: in 1863 they started on their own, borrowing the capital necessary to purchase Forth River Mills, Belfast, from their Malcomson uncles. They married two sisters, Elizabeth and Georgiana, daughters of Thomas Jackson, of the firm of Duff & Jackson, architects of this building, which was opened in 1831.

You will remember that I mentioned earlier two brothers, Anthony and Richard Jackson who finally settled in the South of Ireland. Both were prominent members of the Society who suffered for their principles; Anthony being imprisoned in 1670 and suffering distraint for tithes in several years up to 1681, and Richard the same in 1677. Anthony's son Isaac emigrated to U.S.A. in 1725 with his whole family except his eldest son Thomas. In 1878 was published in Philadelphia a "Record of the Jackson Family," being Proceedings of the Sesqui-Centennial Gathering of the descendants of Isaac and Ann Jackson, 8th month 25th, 1875, which lists the names of no less than 3,150 known descendants of this pair, mostly in America. Here I may

mention that neither President Andrew Jackson of U.S.A. nor General "Stonewall" Jackson have any proveable or indeed likely connection with the Quaker family.

Thomas, the son who remained in Ireland, was ancestor of a large connection; his grandson Anthony Jackson, Freeman of Waterford in 1808, whose wife was Elizabeth, daughter of Samuel Pim of Cork, had a large family of which two sons, Thomas and John Pim Jackson, both architects, came to settle in Belfast. John Pim Jackson's daughter Antoinette married John Marsh, founder of the now defunct biscuit business; her sister Sarabella married James Malcomson of Cairnburn, Strandtown, and was grandmother of Herbert J. Malcomson before mentioned. Both Thomas Jackson and his brother were members of this Society, having joined in 1833 and 1834 respectively. Thomas' son Anthony Thomas followed his father as shareholder in 1891 and his daughter Lydia passed the shares on to me some years ago, so that I now hold the shares which were allotted to my great grandfather in 1833, a fact of which I am very proud.

Thomas Jackson married in 1835 Lydia Newsom Ridgway of Waterford, and by the marriage of his daughter to my grandfather the North and South were united, my grandfather being related to most of the Northern Quaker families, and my grandmother to those of the South:—Ridgways, Newsoms, Penroses, Pims, Wilsons, Robinsons, Clibborns, Unthinks, Bewleys, Strangmans and many more, including Ducketts through whom I have a direct descent from such interesting people as Garret Fitzgerald, the Great Earl of Kildare, Maurice Fitzgerald, 1st Earl of Desmond, James Butler, 1st Earl of Ormonde, Rhys ap Iwdror king of South Wales, Edward I of England and last but not least the arch-villain of all, the author of all Ireland's woes, Dermot MacMurrough, King of Leinster.

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